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STEEL

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FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

THE LAST WORD IN ROLL NECK BEARINGS

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EARINGS ARE IN
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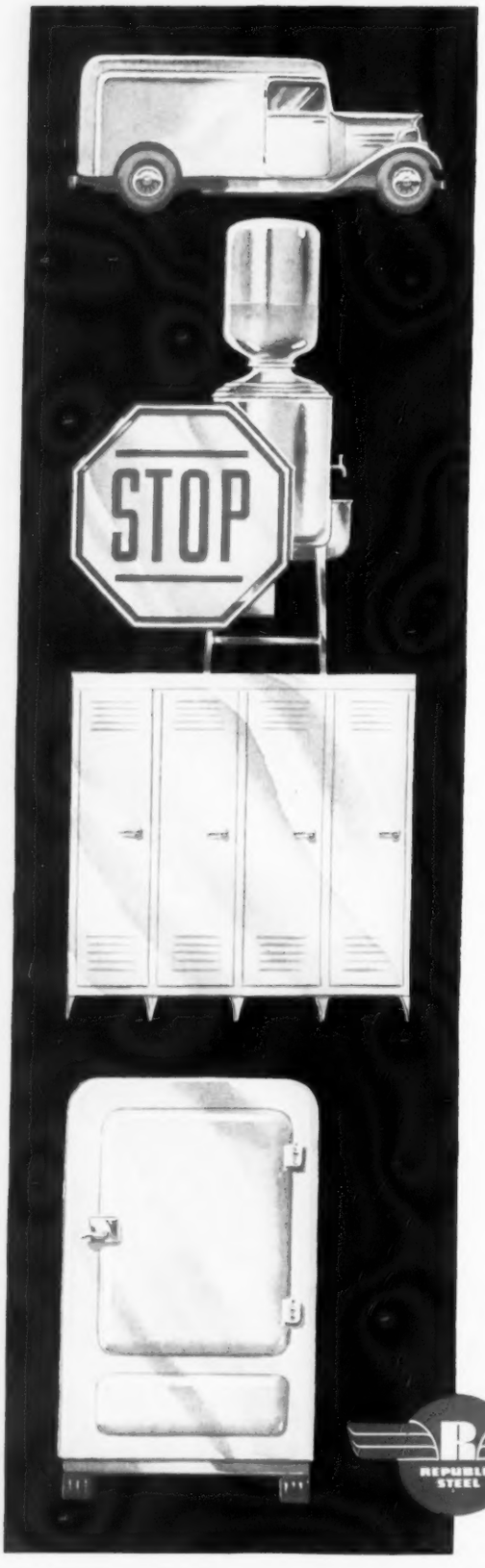
IZES AND TYPES
HOT AND COLD
ILLS BOTH HERE
AND ABROAD

MORGOILS OFFER:
UTMOST PRECISION
HIGHEST POSSIBLE FINISH
MAXIMUM POWER SAVING
GREATEST CAPACITY
LONGEST LIFE
LOWEST UPKEEP

MORGAN CONSTRUCTION COMPANY
Worcester, Mass., U. S. A.

Pittsburgh Office, 1602 Koppers Building

Dampness fails in its attack against REPUBLIC GALVANNEALED



The manufacturer of fabricated sheet metal products such as cabinets, lockers, beverage coolers, refrigerators, signs, truck and bus bodies, and a host of similar products that must retain a decorative finish in spite of rust-promoting dampness in service is justified in using Republic Galvannealed.

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Let us tell you more about *true* Galvannealed as made by Republic's process. Write for information.

Republic Steel
CORPORATION
GENERAL OFFICES · · · YOUNGSTOWN, OHIO

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STEEL

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For forty-eight years—IRON TRADE REVIEW

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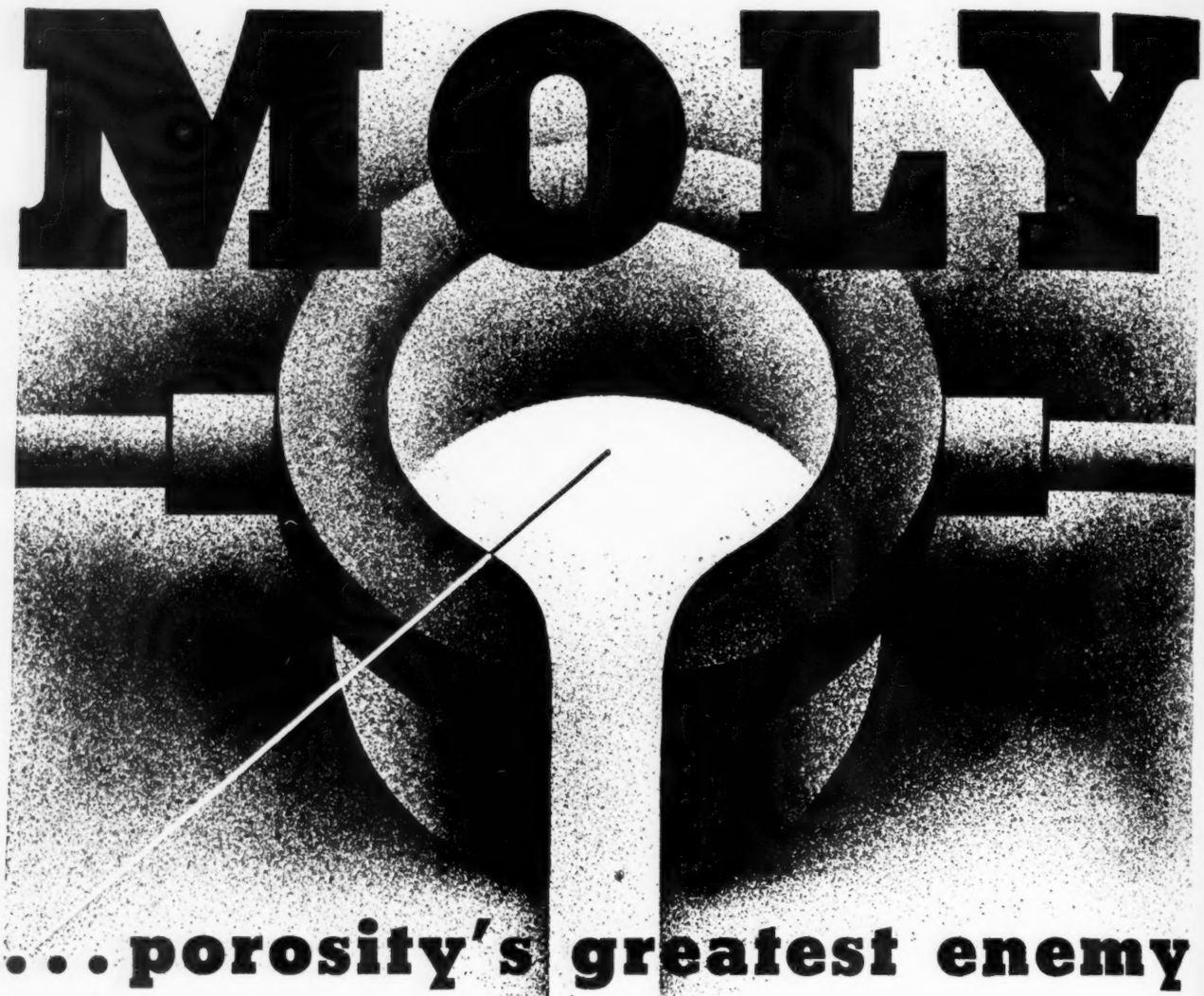


. . . porosity's greatest enemy

THERE are times when whole batches of castings must be scrapped because of porosity. Many up-to-date foundrymen today look to Molybdenum to help them avert such loss-entailing crises. Doing so involves neither heavy added expense nor increased production difficulties. In fact, "Moly" usually saves its cost over and over.

The use of Moly requires no change in the mix — just add the small quantity prescribed by practice and the grain of the product becomes refined. And, instead of increasing machining difficulties, Moly actually diminishes them. Sounds too simple to be believable, doesn't it? Nevertheless, a comparative test will prove the claim as convincingly as was done in this actual instance:

A foundry, casting 12″-diameter pulleys into which a series of 2″ grooves was cut, found that, with a low enough carbon-and-silicon plain iron to eliminate porosity at the base of the grooves, shrinkage occurred in the center of the pulley. The problem was finally and simply solved by adding 1.00% Moly to the iron—which eliminated both the porosity and the shrinkage.

Foundrymen interested in Molybdenum developments will find a great deal of practical information in our book "*Molybdenum in Cast Iron* — 1934 *Supplement*." A simple request brings it to you without charge or obligation. Upon request we will also gladly put you on the mailing list of our periodical news-sheet "*The Moly Matrix*." . . . And, if at any time you are confronted with some puzzling casting problem, you are quite welcome to consult our metallurgists or to use our Detroit experimental laboratories. Climax Molybdenum Company, 500 Fifth Avenue, New York. (In Canada: Railway & Power Engineering Corp., Ltd.)

CLIMAX Mo-lyb-den-um

As the Editor Views the News

WITHOUT question the most important task confronting the United States today is that of awaking public opinion to the need of economy and honesty in the conduct of the government's activities. The President, to whom the nation logically should look for leadership in these matters, has failed his constituents dismally in that respect. By precept and example he has ridiculed and discouraged the virtues of thrift and integrity and has glorified and encourage the sins of waste, extravagance, repudiation and tricky subterfuge. No claim of extenuating circumastnce, such as economic emergency or political expediency, is valid enough to justify these actions.

• • •

The folly of new deal recklessness is emphasized when it is compared with the economies of other governments. That fact was impressed upon American foundrymen who last week went into Canada to attend the A. F. A. convention in Toronto. There they witnessed the sincere effort of a government to live within its income. They read the announcement of Ontario's Premier Hepburn abolishing the agricultural development board and curtailing the activities of four other departments in a "new drive to cut administrative costs and thereby make as light as possible the taxation program which must be launched next session to balance Ontario's budget."

Ontario Is Cutting Costs

• • •

Visiting foundrymen observed another item of interesting Canadian news. Several hundred "relief trekkers" had marched to Ottawa. From their camp in a city park they declared they would not leave until the government paid their way home. Canada's Premier Bennett said, "They were told not to come" and refused aid. Premier Hepburn, for the province, said, "They refused the offer we made when they were en-

Mobs Do Not Dictate Here

route. They met our offer with jeers and catcalls. I say now, as I said then, they will get no further consideration." Mayor Nolan of Ottawa told the trekkers they could not be given assistance from the city's coffers. Dominion, province and city stood firm against a group demanding special favors. Moreover, no voice was lifted in protest against the action of the three governments. Apparently it was accepted by the public as simple justice.

• • •

In itself, the foregoing incident is unimportant, but the principle involved in it is of great significance. Canada is taking care of its relief problem adequately, yet at the same time it has been firm enough to maintain in the minds of the people the idea that hard work and thrift still are admirable qualities. What a contrast this presents to the deplorable situation in our own country! Here we are taking care of our real unfortunates no more effectively than our northern neighbor, yet we have wasted millions of dollars in doing it, and—worse—we have encouraged millions of our people into thinking that it is better to loaf and to live off the government than it is to work at private employment.

A Contrast in Policies!

• • •

Fortunately the United States has sufficient resources to enable it to withstand for a while the destructive effects of monumental blunders. But we should not tempt fate too long. If we start now to reduce government waste, to cut down needless bureaucracy and to quit foolish meddling and experiment—and at the same time by national example try to restore to universal respect the forgotten code of hard work, integrity and thrift—we may yet be able to absorb without too much shock the terrific mistakes to which the new dealers have subjected us. Every industrial executive should thrust himself into politics to the end that honest government for nation, state and local community again can be enjoyed by the public.

Can't Tempt Fate Long

E. L. Shaner

Reviving Business Noted at A.F.A. Convention at Toronto

LAST week members and guests of the American Foundrymen's association to the number of approximately a thousand convened in Hotel Royal York, Toronto, Ont., for the thirty-ninth annual convention of the association. It was the first time since 1908 that the annual meeting had been held in the dominion.

Dan M. Avey

Re-elected president of the A. F. A. A native of Charleston, Ill., he was graduated from the University of Illinois in 1910. He became associate editor of *Municipal Engineering*. Following a connection with the engineering experiment station of the university, and in banking, he went with the Penton Publishing Co., Cleveland, in 1917, becoming managing editor of *The Foundry* in 1919 and editor in 1925

Chief interest of the foundrymen centered upon the extensive technical program and upon plant visitation, inasmuch as no exhibition was held.

Outstanding among the numerous topics discussed were the problems of employer responsibility for industrial health hazards, apprentice training and the modernization of plant and equipment.

Emphasis also was placed upon operating and metallurgical problems relating to steel, gray iron, malleable and nonferrous foundry practice. Details of the technical sessions are presented on pp. 31, 32 and 43 of this issue, and reports of the later sessions will appear in next week's issue.

In the lobby conversations and whenever the state of business cropped out in sessions, the undertone was distinctly optimistic. Not since the depression set in has the prospect before the foundry industry loomed so bright.

Dan M. Avey, editor of *The Foundry*, Cleveland, and president of the association, presiding at the opening session Tuesday, introduced Maj. L. L. Anthes, Anthes Foundry Ltd., Toronto, past president and chairman of the Toronto foundrymen's committee, who welcomed the convention on behalf of Ontario foundrymen. He paid a high tribute to the unity which exists between the people of the dominion and the states.

On invitation of the city of Detroit and its foundry interests, the convention and exhibition of the A. F. A. will be held there the week of May 4, 1936.

C. E. Hoyt, executive secretary, reported a definite increase in membership and called attention to the development of chapter activities as an important factor in the dissemination of foundry knowledge. Four chapters now are functioning and others will be organized soon. Mr. Hoyt also announced the publication by the association of the "Cast Metals Handbook."

Robert E. Kennedy, technical secretary, outlined the features of the technical program, and Frank G. Steinebach, chairman of the international relations committee, read messages of greeting from the Institute of British Foundrymen and the Association Technique de Fonderie de France.

In his address as president, Mr. Avey stressed the inadequacy of the foundry industry in plant and equipment caused by financial conditions of the depression years and the attending obsolescence. In contrast, he said, marked technical advances have taken place during the past six years.

However, he warned the industry against complacency in its attitude toward metallurgical progress and urged that it maintain an aggressive campaign to broaden its markets.

Mr. Avey referred to the lack of trained foundry workers and suggested that more attention be given to apprentice training and other forms of education for the industry.

B. H. Johnson

Re-elected vice president of the A. F. A. Now assistant to the president, R. D. Wood Co., Philadelphia, he has been principally interested in gray iron, and was a founder of the Gray Iron Founders' society. He is a graduate of the Massachusetts Institute of Technology. Former connections include Taylor & Godding, Lynn, Mass.; John T. Robinson Co., Boston; Cresson-Morris Co., Philadelphia

Avey, Johnson Head A.F.A.

President

DAN M. AVEY,
Editor, *The Foundry*, Cleveland

Vice President

B. H. JOHNSON,
Assistant to president, R. D. Wood Co., Philadelphia

Directors

Henry S. Washburn, president, Plainville Casting Co., Plainville, Conn.
Lamar S. Peregoy, president, Sivyer Steel Casting Co., Milwaukee.
C. E. Davis, vice president, Alloys Specialty Co., Coraopolis, Pa.
W. J. Cluff, president, Frederic B. Stevens Inc., Detroit.
Frank A. Sherman, vice president and general manager, Dominion Foundries & Steel Ltd., Hamilton, Ont.

At a business session held Thursday, officers and directors were elected as shown in the accompanying tabulation. A committee for selecting nominees for presentation at the 1936 convention was named as follows: A. E. Hageboeck, Frank Foundries Corp., Moline, Ill.; A. Walscher, American Steel Foundries, Chicago; H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland; and G. H. Clamer, Ajax Metal Co., Philadelphia. The last three past presidents also participate.

Direct American Foundrymen's Association

W. J. Cluff

FIVE directors, who are pictured on this page, to serve 3-year terms, were elected by the American Foundrymen's association at the business meeting of its 39th annual convention held in Toronto, Ont., Aug. 22.

C. E. Davis, at present vice president of the Alloys Specialty Co., Coraopolis, Pa., finished his training course with the Modle Engine Co., Peru, Ind., in 1914. He went with the Pittsburgh Modle Engine Co., Pittsburgh, as tool supervisor, remaining until 1922, when for five years he became district sales manager for W. L. Brubaker & Bros. Co., Millersburg, Pa. He then became general superintendent of the Homestead Valve Mfg. Co., Coraopolis. Last spring he went with the Alloys Specialty Co. He also is efficiency engineer for the Russell, Burdsall & Ward Bolt & Nut Co. at Coraopolis. He is active in the Pittsburgh Foundrymen's association.

Lamar S. Peregoy for many years has been a prominent executive in the malleable and steel castings industry. Born at Davenport, Iowa, he attended the schools of Milwaukee, the city where he has since maintained his home and the center of his business activities.

Entering the employ of the Northwestern Malleable Iron Co. of Milwaukee in 1905, he remained with this organization until 1909. At that

L. S. Peregoy

H. S. Washburn

Buffalo. Later he was transferred to the Brantford plant of this company, remaining until 1914, when he entered the service of the Dominion Foundries & Steel. Starting as foreman with this organization, he has risen to general manager.

Henry S. Washburn, after receiving his early education at St. Paul's school, Garden City, N. Y., attended Yale University. His first commercial position was as bookkeeper with the Corn Exchange Bank of New York. From 1906 to 1917 he held various positions as clerk, credit man, and officer manager. From 1917 to 1921 he was purchasing agent for

C. E. Davis

time he became affiliated with the Sivyer Steel Casting Co., holding various executive and managerial positions, rising to the presidency.

Mr. Peregoy has been active in foundry organizations, having taken a leading part in the direction of the Electric Steel Founders' Research Group, and more recently in the Steel Founders' Society and the National Founders association.

Frank A. Sherman is general manager of the Dominion Foundries & Steel Ltd. of Brantford, Ont. His first industrial experience was with the Pennsylvania Malleable Co., Pittsburgh, as assistant chemist, in 1906. In 1907 and 1908 he was employed by the Mesta Machine Co., Homestead, Pa., and the Fort Pitt Malleable Co., Pittsburgh, as chemist.

From 1908 to 1912 he was foreman for the Pratt & Letchworth Co.,

F. A. Sherman

Turner & Seymour, of Torrington, Conn. Since 1921 he has been president and treasurer of the Plainville Casting Co., Plainville, Conn.

Mr. Washburn has been much interested in foundry technical association work, is a member of the Connecticut Foundrymen's association, the A.F.A., National Founders' society, and the Gray Iron Founders' society.

W. J. Cluff, elected a director of the A.F.A. to represent the foundry equipment and supplies interests, obtained his business experience with Frederic B. Stevens Inc., of Detroit. He entered the services of this company in 1901 as office boy. By his energy and effective work he has risen to the presidency of this firm, which is one of the oldest and most widely-known foundry supply houses. Mr. Cluff was made president in 1934 on the death of the founder, Frederic B. Stevens. Mr. Cluff has been actively connected with the work of the Detroit Foundrymen's association for the last 25 years.

Hits Destructive New Deal Policies

A SHARP attack against destructive policies of the federal government featured the dinner meeting of the Foundry Equipment Manufacturers' association held in Toronto Tuesday in conjunction with the annual convention of the American Foundrymen's association.

The speaker, Thomas W. Pangborn, president, Pangborn Corp., Hagerstown, Md., and president of the National Founders' society, charged that the acts of the federal government during the past two years indicate that the administration "is determined to take complete control" of all the activities which in 1930 Mr. Roosevelt, as governor of New York, "so well said should remain beyond the domain of federal action."

Govt. Violates All Precepts

Mr. Pangborn enumerated a few of the primary principles which must underlie every honest and efficient private business. One must produce honest merchandise, its price must be right, relations with customers must be good, competition must be fair and honorable, goodwill and cooperation of employes must be earned and kept, debts must be paid and books must be balanced at reasonably short intervals. Mr. Pangborn then applied these tests to the federal activities of the past two years.

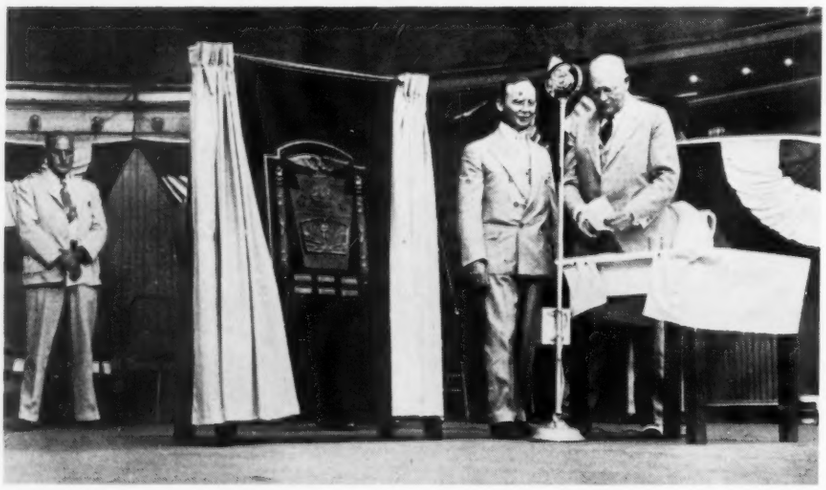
"In my judgment," he said, "much of its merchandise is sold under false labels; the price, in the form of taxation, is and will continue to be exorbitant; its relations with its customers, namely the taxpayers, are not open and fair and devoid of discrimination; it does not compete fairly and honorably with private business; its books are not balanced and it has incurred indebtedness so enormous that a balancing of its budget can probably take place only through a further resort to monetary manipulation, which, shorn of the softened language of the political economist, amounts to repudiation.

"The time has come to call a spade a spade. What is needed is not more government control of industry but more statesmanship and common sense honesty in the operations of government."

Frank Connolly, of the federal housing administration, spoke on how FHA can help manufacturers to sell foundry equipment. He described the provisions of the act pertaining to the purchase of equipment, stating that loans up to $50,000 may be attained through local banks with the administration guaranteeing against loss up to 20 per cent. He declared that the borrower benefits in that money is available at a low rate and can be paid back in easy monthly payments. The seller benefits in that a cash transaction is possible.

Samuel John Frame, secretary, Metal exchange, Toronto, discussed "Co-operation in Industry," stating that in Canada regulation of prices is an important function of trade association work.

Mesta Is Honored for Safety



Lorenz Iverson (center), president of the Mesta Machine Co., Pittsburgh, is accepting the Pennsylvania Manufactu ers' association safety trophy from John M. Flynn (right), president of the Manufacturers association, at the company's annual picnic. Former Gov. John K. Tener (left), of Pennsylvania, delivered an address on safety

New Capacity

REPRESENTATIVES of the Midwest Steel Corp., a subsidiary of the National Steel Corp., Pittsburgh, which operates the Weirton Steel Co. and Great Lakes Steel Corp., told war department engineers at a hearing in Chicago Thursday that a plant costing $5,000,000 and employing 1200 persons would be erected five miles east of Gary, Ind., in event the government built a harbor there, cost being estimated at $3,000,000.

Several years ago National Steel acquired the Indiana site and named it Williams, Ind., in honor of the president of Weirton. It is understood that National contemplates making tin plate there.

$20,000,000 MORE FOR GARY

Last week the American Sheet & Tin Plate Co., subsidiary of the United States Steel Corp., announced that a second appropriation of $20,000,000 had been granted for improvements to its Gary, Ind., works. A division of $12,500,000 for sheet mills and $7,500,000 for tin mills has been made. Work will not be started until 1936, after the program now under way has been completed.

Republic Steel Corp. and Jones & Laughlin Steel Corp. are reported actively negotiating for additional mill equipment.

Transportation

EDWARD G. BUDD MFG. CO., Philadelphia, which has pioneered in the production of welded stainless steel streamlined trains and railroad equipment, announces that it is actively negotiating with four important railroads on eight streamlined trains, costing a total of $4,000,000. Reconstruction Finance Corp. is prepared to finance such equipment.

Fairless Quits Republic for Steel Corp.; Wysor and White Advanced

RESIGNATION of B. F. Fairless as executive vice president of the Republic Steel Corp., Youngstown, O., effective Sept. 15 in order that he may accept a post, as yet unidentified, with the United States Steel Corp., has revived reports of an impending reorganization of subsidiaries of the Corporation.

Myron C. Taylor, chairman of the board of the Steel corporation, Friday refused to comment on the significance of the acquisition of Mr. Fairless. At various times over the past few years there has been open speculation concerning a possible consolidation of Corporation subsidiaries in the Pittsburgh and Chicago districts into one company for each district, and an amalgamation of sales forces of the Corporation in leading cities.

Reorganization Still Incomplete

It is recalled that in December, 1933, when Mr. Taylor stepped aside as chairman of the finance committee and retained the chairmanship of the board, a summary of the reorganization of the Corporation under the aegis of Mr. Taylor following his identification with the Corporation in 1927 was issued.

This program embraced three major phases—first, revision of the capital structure, resulting in a reduction of the funded debt; second, revamping of the Corporation's plants and physical properties, resulting in abandonment of unprofitable operations and rehabilitation of the more profitably located plants; and third, an adjustment in personnel, resulting in retirement of many older employes and a new setup at Corporation headquarters.

At that time it was intimated that another feature of reorganization would eventually evolve, and that further consolidation of properties and subsidiaries would ensue with greater concentration of operating control at Pittsburgh and other major districts into larger units and transfer of certain of the New York activities to other centers.

B. F. Fairless

Nothing has been publicly stated to associate the identification of Mr. Fairless with the Corporation as heralding the consummation of this reorganization, but every important change in personnel precipitates speculation.

Mr. Fairless, on leaving Ohio Northern university, went with the Wheeling & Lake Erie railroad, in a few months becoming a transit man for the Central Steel Co., Massillon, O., near which he was born. He progressed through nearly every department connected with the production of alloy steels, becoming vice president in charge of operations. In February, 1926, he was made vice president and general manager.

On the merger of the Central Steel Co. and the United Alloy Steel Corp. as the United Alloy Steel Corp. he was made vice president in charge of operations. He continued as vice president of the Republic Steel Corp. when United Alloy became part of the large Republic consolidation in December, 1929.

Following the resignation of Mr. Fairless last Wednesday, T. M. Girdler, chairman of Republic, on Thursday announced the promotion of R. J. Wysor to executive vice president and general manager to succeed Mr. Fairless. In turn, C. M. White was elevated to vice president in charge of operations in succession to Mr. Wysor. Both appointments are effective Sept. 16. Both Mr. Wysor and Mr. White came to Republic from the Jones & Laughlin Steel Corp., Pittsburgh, in 1930, following the appointment of Mr. Girdler as chairman and later as president of Republic.

R. J. Wysor

C. M. White

Merger

AMENDED registration statement covering the securities involved in the merger of the Republic Steel Corp., Corrigan, McKinney Steel Co. and Truscon Steel Co. was filed in Washington Aug. 22. This brings up to date the original statement filed with the securities and exchange commission Nov. 28, 1934. As soon as the registration of the securities becomes effective, expected to be early in September, the merger will be formally effected. Special meetings of stockholders of Republic and Corrigan, to act upon the merger plan, have been called for Sept. 16.

INLAND MEETS SEPT. 20 ON ACQUISITION OF RYERSON

Inland Steel Co. stockholders will meet Sept. 20 to approve the proposed acquisition of Joseph T. Ryerson & Son Inc., Chicago (STEEL Aug.

12, p. 14). Approval of an increase in Inland's capital stock from 1,200,000 shares to 1,600,000 shares also will be sought, while four new directors will be elected to fill additional offices created recently by the board.

Production

STEEL production continued to forge ahead last week, gaining 1½ points to 52½ per cent. This rise corresponded with heavier schedules at Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Buffalo and New England. In the Wheeling and Cleveland districts slight declines were noted, while other districts held unchanged. Further details follow:

Youngstown—Gained 3 points to 60 per cent last week, and tentative mill schedules indicate a 62 per cent rate this week. Resumption of an idle bessemer accounts for part of last week's rise.

Detroit—Unchanged at 94 per cent, with 16 out of 17 units melting.

New England—Up 17 points to 73 per cent last week, two producers adding open hearths. This rate, the highest attained in this territory thus far this year, will be maintained this week.

Chicago—Increased for the fourth consecutive week. Last week's average of 60 per cent was a gain of 3 points over the preceding week and the highest ingot rate in more than six months. Sustained operations are seen for the near future, with heavier pig iron production in prospect. Thirteen of 36 steelworks blast furnaces recently were active.

Buffalo—Advanced 3 points to 37 per cent, as additional open hearths were lighted last week. It is expected this rate will continue through this week. Fourteen open hearths are active.

Pittsburgh—Up 1 point to 43 per cent. Twenty-three furnaces are now in blast. Carnegie is scheduling 9 out of 32; Jones & Laughlin, 7 of 11, and American Steel & Wire, National Tube, Pittsburgh Crucible Steel, and Pittsburgh Steel, 1 each. Bethlehem has 3 out of 7 at its Cambria works, Johnstown, Pa., on the active list.

Birmingham — Requirements for steel maintained steelmaking at 35½ per cent. Eight open hearths are active, and five are in shape for quick resumption.

Wheeling—Down 8 points to 76 per cent last week, 28 units being active out of 37, compared with 31 the preceding week.

Cleveland-Lorain—Down 8 points

(*Please turn to Page 77*)

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in 10 Leading Districts

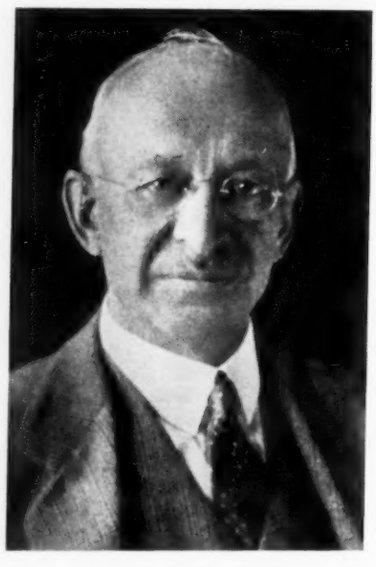
	Week ended Aug. 24	Change	Same week 1934	Same week 1933
Pittsburgh	43	+ 1	10	43
Chicago	60	+ 3	29½	48
Eastern Pa.	33	+ ½	20	39
Youngstown	60	+ 3	21	53
Wheeling	76	— 8	26	80
Cleveland	51	— 8	15	72
Buffalo	37	+ 3	0	41
Birmingham	35½	None	25	55
New England	73	+17	29	85
Detroit	94	None	77	55
Average	52½	+ 1½	20	48

Died:

WALTER S. Russel, founder of the Russel Wheel & Foundry Co. and later the Russel Steel Construction Co., Detroit, at his summer home, Belle River, Ont., Aug. 17. Born in Detroit in 1855, he was graduated from the University of Michigan in 1871, receiving the degree of civil engineer in 1875 and his master's degree in 1905.

After spending five years in the shops of his father, who was one of the first manufacturers of railroad cars and equipment in Detroit, Mr. Russel, with his brothers, George H. and John R., organized the Russel Wheel & Foundry Co. in 1880. The Russel Steel Construction Co. was a later expansion. From Mr. Russel's shops came the structural steel for many of Detroit's largest buildings.

Mr. Russel was a director of the American Radiator Co., Detroit Steel Products Co., Hoskins Mfg. Co., McCord Radiator & Mfg. Co., McCord Mfg. Co., and Detroit Lubricating Co. He was vice president of the Detroit Engineering society and a past vice president of the American Society of Mechanical Engineers. Last winter he was tendered a testimonial dinner on his eightieth birthday by over 100 friends. Funeral services were held in Detroit Aug. 19.



Peter J. Krentz

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William J. Iwer, 72, superintendent of the Seaman Body Corp., Milwaukee, in that city Aug. 18.

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Fred G. Kent, pioneer designer of machine tools and consulting engineer for many nationally-known manufacturers in this field, Aug. 17 in East Aurora, N. Y. He retired in 1928 because of ill health.

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A. Y. Dyer, metallurgist for Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., Aug. 16. A specialist on uses of pig iron, he formerly was connected with the Alabama By-Products Corp. and the National Cast Iron Pipe Co.

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J. H. Hall, assistant chief engineer, Electric Controller & Mfg. Co., Cleveland, in Morgantown, N. C., Aug. 21. He was a graduate of Rose Polytechnic institute, Terre Haute, Ind., and had been in Cleveland since 1904, coming from Danville, Ill.

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Hubert F. Hanks, manager of sales of steel and wire products, Pittsburgh Steel Co., at Pittsburgh, Aug. 23. Mr. Hanks was born in Laurinburg, N. C., March 21, 1888, and spent his early life in New Bern, N. C. He was in the employ of the Pittsburgh Steel Co. since 1909, and from 1920 to 1930 was manager of the fence department.

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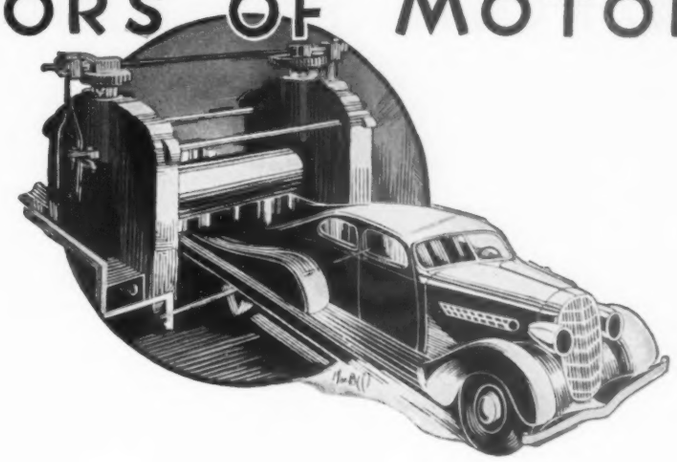
Rodney P. Snelling, 74, vice president and director, Saco-Lowell Shops, Boston, manufacturer of textile machinery, Aug. 15 in Beverly Farms, Mass. Graduating from Harvard university in 1881, Mr. Snelling immediately entered the Pettee Machine Shop Works, now the Saco-Lowell organization and became a leader in development of modern textile mill equipment.

♦ ♦ ♦

Peter J. Krentz, 64, vice president of the Buffalo Foundry & Machine Co., Buffalo, Aug. 16. Early displaying a mechanical bent, at the age of 14 he learned the pattern making trade with the George W. Tifft Co., Buffalo. In 1901 he organized the Model Pattern Co., selling it two years later to take charge of the pattern department of the Buffalo Foundry & Machine Co. In 1906 he became superintendent, during the World war was made works manager, and in 1923 was promoted to vice president. He was a former director of the American Foundrymen's association and in 1923 attended the International Foundrymen's association meeting abroad.

MIRRORS OF MOTORDOM



DETROIT

FROM the manner in which stainless steel is being specified for exterior trim, 1936 automobiles will be brighter as well as bigger.

There will be a vogue of body belts or molding, some beginning at the radiator grille and encircling the car. At least one line will feature chevrons on the front fenders just below the headlamps, like the 1935 LaSalle.

Many running boards will be bound with stainless moldings. Hood sides and louvers will be highly trimmed with stainless. Hub caps will be larger, and those that are not stainless will be chrome-plated.

Some stainless veneer will be used, but solid material appears to have the edge. Extremely light sections will be used, some as thin as 25/1000-inch, but the average per car probably will be the greatest since Ford used a solid stainless radiator shell.

In addition to flashier exteriors, bodies for 1936 generally will be larger. It will be the exception that will not seat three comfortably in the front as well as the rear. This will entail, in some cases, encroachment upon the running board.

Rear Treads To Be Wider

While there have been some departures, the standard tread front and rear has been 56 inches. Next year, there will be some rear treads 57 and 57½ inches. The trend toward rear compartments or trunks that are integral with the body will engulf those makers who lagged this year.

Bigger bodies mean more steel, and also more weight, and in turn engine performance is being stepped up to handle this additional weight without any sacrifice of top speed or pick-up. These changes, however, will be minor.

One development on which considerable experimentation has been done but which will not mature generally for 1936, if indeed it appears in a single line, is air-conditioning.

It would be possible to insulate the pan underneath, and also the top and the side panels. The proportion of glass to solid area in an automobile is greater than that in a residence, but this is not insurmountable. But the association of fresh air and breezes with an automobile ride appears to be indissoluble.

However, some form of air-conditioning is an inevitable improvement, and all the leading body manufacturers have done more or less experimenting. The advent of steel tops has accelerated considerable advance in insulating against outside heat. The trend toward all-steel bodies has brought a steel pan under cars instead of open wood construction. Clutches, generators, even the engine interior are now air-cooled.

In Home, Then in Autos

An important Fisher Body official is of the opinion that air-conditioning is coming, perhaps sooner than may now be generally expected, but not until the building industry "sells" the idea in residence construction. Once people realize fully the advantages of air-conditioning in their homes they will demand it in their automobiles. Hence a blessing and an admonition to the building industry to get busy.

Speaking of insulation of tops, Hudson-Terraplane is understood to have done a bang-up job in the forthcoming 1936 models. This is the year in which Hudson-Terraplane completely changes body dies, it is revising its method of fabricating the all-steel top, and it is bringing out a method of insulation that is claimed to be a great advance. The Hudson-Terraplane top will be fabricated in sections, like Nashes and unlike the Fisher turret top, but when welded and finished it is in effect and in strength one piece.

On the subject of bodies, a unique program is understood to have been worked out by Reo, Graham and Hayes Body. What is basically the body for the large Reo will also be used on the large Graham, supplanting the present body.

Hayes is moving considerable equipment from its Grand Rapids plant to the Wayne plant of Graham. There it will turn out the large bodies for both Graham and Reo. The interior trim, of course, will be different, and the variations in exterior trim and hood and fenders will efface all striking resemblance, but the economy in the use of dies should be marked.

This practice is not unusual. For the past several years Dodge and Plymouth bodies, and in fact some of the other Chrysler lines, have been struck off the same dies. Likewise Fisher has been able to use the identical dies for many body panels and parts for the lower rungs of the General Motors lines.

Reo, incidentally, has done a noteworthy business this year in trucks, and is starting production on a new low-priced truck job which will be formally announced sometime in September. Reo production has been about 250 units weekly; Graham about 400.

Warner Has Chrysler Contract

At this distance it looks as if one of the principal mechanical innovations will be the transmission overdrive, to be featured by Chrysler, to name one maker. This overdrive, which amounts to a fourth speed and gives a greater speed without a compensating increase in engine revolutions, is being manufactured for Chrysler by Warner Gear.

Last week was another low spot in automobile production, the total of assemblies of passenger cars and trucks being 50,585, compared with 56,386 the first week preceding and 48,067 the second. Buick, Olds, Pontiac, Chrysler, DeSoto, Willys and parts of Chevrolet were closed.

In fact, there are few manufacturers still running their assembly lines that have not shut down some departments for the changeover. Hudson-Terraplane is expected to go

down this week. Because mechanical changes will generally be subordinate to body refinements for 1936, many plants will be able to restrict their shutdowns to three weeks.

Buick is understood to have run off some pilot cars, and is testing these. Tentatively, formal announcement of the new Buicks has been set for Saturday Sept. 28, but there probably will be some pre-views prior to that time.

So far as steel and other automotive materials are concerned, they are about to emerge from the low point of the changeover period. Beginning this week, shipments into the Detroit area will increase, probably reaching a peak about Oct. 1.

Labor day will mark the turn in some plants, notably the General Motors foundry group at Saginaw, which will make the real start on castings for many General Motors cars on Sept. 3.

Incidentally, Labor day is being watched unusually closely this year on account of the labor situation. Father Coughlin will harangue automobile labor at Belle Isle the Sunday before Labor day, and the A. F. of L. on Labor day. As one observer notes, Father Coughlin may garner in many pledge cards, but the A. F. of L. has the organization, and that counts.

Early, Short Layoff Help

One of the best things that can be said for the early announcement of 1936 models is that it may avert labor difficulty. This year workmen will have an unusually short time out, and this layoff comes at a time when workers can busy themselves around their homes or gardens or take the family for a little trip. In past years, the layoffs have come when the weather was unseasonable, and the corner pool room was a fertile place for loafing and haranguing.

Chevrolet, which was the only General Motors plant still assembling last week, turned out 24,000 jobs. Last week it began issuing releases for its first authorization for 1936 cars, this totaling slightly over 250,000 units for the domestic trade and upward of 75,000 for export.

This is believed to be the largest initial authorization in history by Chevrolet. It breaks down into 200,000 passenger jobs, a few more master than standard models; about 17,000 commercial cars and about 37,000 trucks. The export total of about 75,000 is almost evenly divided between passenger cars and trucks.

Chrysler not only is placing many millions into new equipment for its present plants but it also has an eye to the future in the acquisition of the Wills Ste. Clair plant at Marysville, Mich., just outside Port Huron. It is said that Chrysler has no immediate plans for using the plant.

It is interesting that this plant, built in 1918 and used until 1922 for the manufacture of Wills Ste. Clair cars, was the dream of C. Harold Wills, at one time chief engineer for Ford, the past few years a consulting engineer for Chrysler and largely responsible for the mola (molybdenum) steels to which Chrysler is going altogether. The Wills Ste. Clair was a molybdenum car, as Chrysler is now making its cars.

Hupp, which still is operating intermittently but on an increasingly improved scale, has announced the trunk model predicted here some weeks ago. When its 1936 line is introduced, there will be a 2-door model, and perhaps a further broadening of the line. A new transmission is also in prospect.

Like New Hupp Regime

Under the Drum regime, Hupp is doing better, its morale has been lifted, and in event 1936 is the good automobile year everyone is expecting it to be, this fine old maker will be back in its rightful place. A unique advertising and special factory-dealer co-operative plan is being matured. The only bad spot in the Hupp picture now is another stockholders' meeting and the inevitable disturbing campaign for proxies.

Dubois Young and several other former Hupp executives are busy in a suburb of Detroit developing a small, low-price car.

Another important development is being conducted by E. L. Cord, of Auburn-Cord fame, who has built a new front-drive car that is markedly underslung, is a sort of cross between an automobile and an airplane in its streamlining features, has retractable headlamps in order to minimize wind resistance in the daytime, and has an instrument board that is reminiscent of this part of a plane.

Still on 1935 models, Ford last week assembled 18,025 units. Completion of a 1400-pound pressure boiler at the Rouge power house to provide steam for operating a new turbo-generator at a temperature of 900 degrees Fahr. is near. . . E. S. Evans, an Atlanta automobile dealer, has bought the assets of the American Austin Car Co. at Butler, Pa., for $5000, assumption of a $150,000 mortgage, accrued interest of about $40,000 on this mortgage, and $35,000 in back taxes. . . . In two weeks the Fisher No. 1 plant at Flint, servicing the Buick plant there with bodies, will be at capacity for the first time since 1930 and will probably employ 7200 persons, another record. . . . Studebaker commercial car sales in June and July exceeded any comparable period in Studebaker history by 33 per cent. . . . Sales of Four Wheel Drive trucks in the first half year topped last year by 63 per cent.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115.272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,320
July	229,357	264,933	*340,000
7 Mo.	1,219,471	1,979,196	*2,602,144
Aug.	232,855	234,811	.....
Sept.	191,800	170,007	.....
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Aug. 3	69,415
Aug. 10	48,067
Aug. 17	56,386
Aug. 24	50,585

Financial

EASTERN ROLLING MILL CO., Baltimore, reports net loss of $111,296 in the second quarter, compared with a deficit of $21,099 in the second quarter of 1934.

KEYSTONE PROFIT IS STEADY

Keystone Steel & Wire Co., Peoria, Ill., for the year ended June 30 shows net income of $1,167,790, compared with $1,152,640 in the preceding year.

NICKEL PROFIT IS HIGHER

International Nickel Co. of Canada Ltd. reports a second quarter profit of $5,420,615, compared with a net of $4,917,627 in the first quarter. First half profit is $10,338,242; last year it was $10,012,642.

LOCOMOTIVE CUTS DEFICIT

American Locomotive Co., New York, reports net loss of $772,225 in the first half, compared with a deficit of $1,288,966 in the comparable 1934 period. Unfilled orders June 30 totaled $3,813,246, a gain of $1,100,000 since Jan. 1.

REYNOLDS SPRING EARNS MORE

Reynolds Spring Co., Jackson, Mich., reports net of $246,911 in the first half of 1935, compared with $169,827 a year ago.

MYERS NET IS HIGHER

F. E. Myers & Bro. Co., Ashland, O., in the nine months ended July 31, shows a net profit of $538,482, compared with $483,401 in the comparable preceding year.

Industrial Men in the Day's News

Herbert J. Watt, New District Sales Manager in New York for Jones & Laughlin Steel Corp.

He embarked upon his steel career in the Philadelphia office of the Carnegie Steel Co.

In 1917 he went to Washington, participating in the busy steel-allocation days of the World war.

Since 1925 he has been at Pittsburgh with Jones & Laughlin, chiefly in railway sales.

HERBERT J. WATT, since 1928 manager of sales of railway materials for the Jones & Laughlin Steel Corp., Pittsburgh, has been appointed district sales manager at New York to succeed Robert M. Kilgore, who died Aug. 7.

Starting in the Philadelphia office of the Carnegie Steel Co., Mr. Watt was transferred to the Washington office of that company and other United States Steel Corp. subsidiaries in 1917, being assigned to government matters and commercial sales in Virginia.

On Dec. 1, 1925, he went with Jones & Laughlin, joining the district sales office in Pittsburgh, and later the railway sales department, being appointed manager of that department in 1928.

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A. F. Franz, Alan Wood Steel Co., will succeed as open-hearth superintendent C. R. Henry, who has resigned to join the Valley Mould & Iron Co. at Youngstown, O., W. G. Wilson, 84-inch plate mill superintendent, will succeed Mr. Henry as blooming mill superintendent. Both changes were effective Aug. 15.

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J. H. Brown, formerly eastern sales manager of Sullivan Machinery Co., has joined Worthington Pump & Machinery Corp., Harrison, N. J., as regional manager of its mining and construction division, covering the midwestern teritory, with headquarters in Chicago.

Mr. Brown is a graduate of Massachusetts Institute of Technology, class of 1905. During the NRA period he served as a member of the code authority of the Compressed Air institute.

♦ ♦ ♦

H. G. Dalton, senior partner of Pickands, Mather & Co., Cleveland, sailed on a European trip Aug. 21.

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R. J. Wean, Wean Engineering Co., Warren, O., and L. A. Vaughn, Vaughn Machinery Co., Cuyahoga Falls, O., have been elected trustees of the University school, Cleveland.

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William Reese, who for 12 years has been connected with the National Tube Co., New Orleans, has been appointed manager of the tubular department for the Pacific Coast Steel Corp., San Francisco.

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William F. Graver, former president of the Graver Corp., Chicago, has assumed charge of the storage tank division of Erman-Howell & Co. Inc. The latter operates a railroad tank car dismantling plant at 300 West Eighty-Seventh street, Chicago.

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Herbert P. Ladds, vice-president and general manager, Lamson & Sessions Bolt Co., Birmingham, Ala., has been chosen as organization chairman for the thirteenth annual Community chest appeal to be made in Birmingham this fall.

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J. G. Hoag, identified with the Osgood Co. for 15 years, has been appointed manager of the Philadelphia branch at 336 North Twenty-third street. Mr. Hoag has had a broad experience in the field of excavating machinery, having been among the first to introduce Osgood revolving type shovels, cranes and draglines in the eastern seaboard territory.

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Edward W. Voss, 3241 Latonia avenue, Dormont, Pittsburgh, has been appointed distributor for United States and Canada for the Karl Fr. Ungerer Maschinenfabrik of Pforzeim, Brotzingen, Germany, maker of rolling mill equipment.

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W. A. Givens, formerly assistant superintendent of the Allegheny Steel Co., Brackenridge, Pa., has been appointed general manager of the company.

A. E. Miller, formerly assistant general superintendent, is now general superintendent.

M. C. Harris has been promoted from manager of the service department to assistant general manager.

These appointments were announced by W. F. Detwiler, executive vice president.

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Carl R. Raquet, who has been Fenestra sales manager of the Detroit Steel Products Co., Detroit, has been elected a vice president of the company. He joined the company in 1913 as a salesman in the Detroit district. In 1917 he was appointed district sales manager, and later was made Fenestra sales manager.

Carl R. Raquet

Other officers of the company are. John G. Rumney, chairman of the board; Victor F. Dewey, president;

(*Please turn to Page* 78)

WINDOWS OF WASHINGTON

WASHINGTON, FRIDAY

AFTER eight months of activity the first session of the 74th congress is on the eve of adjournment. Legislation of the highest importance to industry, has been introduced, passed and still is pending on the calendars of the two houses.

The country survived the demise of NRA, the expectation of new dealers to the contrary, and it remains to be seen whether the reaction to the adjournment of congress is equally favorable. The two variables are the effect of legislation passed, and the relief generated by the fact that the legislative mills are stilled.

But they will remain quiet only for a few months. Next Jan. 3 congress convenes again, and since it will be the second session of the 74th congress, the new session will be a continuation of the old one. All bills remain exactly as they were at adjournment, and need not be reintroduced as if a new congress were beginning to sit.

Survey Metal Products Industry

Of particular interest to industry, during the session now ending congress passed the social security act, extended NRA to April 1 in an abbreviated form, renewed the RFC, passed the revenue bill increasing corporation taxes, and created a new labor relations board.

Incidentally, NRA Friday instructed its regional and state directors to initiate field surveys of the fabricated metal products industry to ascertain changes in labor and trade practice standards since the termination of codes.

So far as the nerve center of the iron and steel industry is concerned, it has sustained two severe shocks from this session of congress. They are the social security and revenue acts.

Under the former an unemployment insurance tax will nick steel payrolls 1 per cent beginning in 1936, 2 per cent beginning in 1937, and 3 per cent thereafter. Old age pension levies begin with 1 per cent in 1937 and increase to 3 per cent in 1949. For details of the direct effect upon the steel and metalworking industries see STEEL for Aug. 19, p. 11.

The President Friday named John G. Winant, Arthur J. Altemeyer and Vincent Morgan Miles to administer his program.

Up to now the corporation income tax has been 13¾ per cent. Hereafter it will be 12½ per cent on the first $2000 of profit, 13 per cent on the net between $2000 and $15,000, 14 per cent on $15,000 to $40,000, and 15 per cent on all above $40,000.

The capital stock tax will now be $1.40 on each $1000, against a former rate of $1. Individually, of course, iron and steel executives will feel the pinch of higher income surtaxes, and their estates will be hit.

Unions Fight Over Guffey Bill

Late Friday it appeared that the Guffey coal control bill, virtually creating an NRA for that industry, would emerge from conference for final passage and signature. Designed to rationalize the coal industry and to prevent a strike, the bill has torn the A. F. of L. wide open.

Unless altered at the last minute, the bill would permit only representatives of the United Mine Workers to sit on the various boards that are established. The machinists, metalworkers and other trade unionists, attempting to gain a foothold in what John Lewis and his vertical United Mine Workers have dominated, are fighting desperately for a foothold in the industry.

The administration was fighting hard in the last minutes of this session to pry the Walsh government contract bill out of the judiciary committee of the house. Twice the committee has refused to report it out, following its passage by the senate, but the President persists. This bill would perpetuate NRA standards for government contractors and is quite generally believed to be unconstitutional. For that matter, the Guffey bill and the national labor relations board also are believed unlikely to pass a test before the Supreme Court.

No action at all has been taken on the 30-hour week bill which has the strong backing of the A. F. of L. The utilities bill emerged from conference in a compromise form but is more favorable to the President than to its utility opponents. For steel there is the danger that a precedent might be set that would be a wedge for dissolving steel holding companies.

END OF CONGRESS MAY FREE FUNDS FOR MACHINE TOOLS

Harry Hopkins, relief expert, is still mulling over the request made to him some time ago by both the army and navy for a large appropriation for machine tool equipment. There is talk that all or some of this money may possibly be made available as congress leaves Washington.

It may be recalled that the navy asked for $25,000,000 for machine tools to bring its navy yards in various parts of the country up to date on equipment. Also, the ordnance division of the army asked for $5,000,000, and the army air corps asked for $3,000,000.

The story is that Mr. Hopkins feels that he cannot allow any of this money to get out because of the ruling of the President that only $1140 per man per year shall be spent. Of course, machine tools cannot be purchased on any such basis.

However, those who are working close to this matter feel that when congress finally gets out of the capital some of these matters will be adjusted.

STEEL FOR WPA JOBS STILL SNARLED IN RED TAPE

The production of literally thousands of tons of steel is being held up because of the refusal of the administration to cut much unnecessary red tape in connection with the be-

ginning of the work program for grade crossing eliminations and the building of new roads.

More than three months have passed since the President said that these programs would get under way at once—and still they are held up. Up to this time, the grade crossing and road program of only one state —Michigan—has been approved.

Reports reaching here indicate that state road commissions and others having to do with this program are thoroughly disgusted with the way it has been handled.

Part of the fault lies in the fact that the administration placed a maximum of $1400 per year per man on the two programs, and it is admitted that the grade crossing and road building cannot be done for that figure. Therefore the adminstration has winked its eye and gone around another way to serve the same purpose.

It has been held that, as long as this cannot be done, the states must pool their road and grade crossing funds with other funds which they have, including the federal aid, road maintenance, etc.

Delaying Factors Are Multiplied

In this connection, it is reported by an authority in a position to know that even when the complete state programs have been submitted it sometimes literally takes weeks to get final approval.

The New York state program, for instance, has been in the hands of Washington authorities for more than three weeks, with no action taken yet.

Another thing, the administration has been insisting all along that no program be submitted by a state until the entire road building and grade crossing program is submitted at once. This leads to so much delay that it has now been reduced so that 25 per cent of the program can be presented at one time.

It was two months after the bill was actually signed before the regulations were available to state highway commissions, and it has now been six weeks since these regulations were available and still nothing approved, except Michigan.

Reports here are to the effect that this holdup is not the fault of the states. And all of this in spite of the fact that the President said right after the work relief program was signed that these road building and grade crossing programs would be begun at once. The delay so far has been three and a half months.

BLUE EAGLE STILL HEADLESS

Business and industrial interests of the country seem to have lost all interest in that erstwhile Blue Eagle organization—NRA.

Whether that is the reason the President has let the organization go headless for almost a month, or whether there is something other behind his not appointing an administration, is a matter of conjecture only.

At repeated press conferences during the past month he has been asked about a new administrator, but his answer is always the same—he has not got around to it yet.

It is learned at NRA that some 2800 persons still are on the payrolls. Most of them are not doing anything at all, while others are carrying on some of these so-called industrial studies.

FTC PROVING NOT SO LENIENT ON TRADE AGREEMENTS

In full flush of being able to take over the work of NRA, Judge Ewin Davis, chairman of the federal trade commission, several times told how lenient on business the commission would try and be in working out new trade agreements.

Just how liberal the commission has turned out to be is shown by the fact that now, after the commission is satisfied with one of these agreements, it turns it over to the department of justice so that the latter can take a crack at it.

This has just become known, and it can be stated definitely that up to this time when the commission has been satisfied with an agreement it has been accepted and made public. It only remains to be seen now how it will all work out with the G-men of industry at the department of justice also scrutinizing it.

WHO PROBED MANGANESE?

Domestic manganese manufacturers who are ever hopeful of obtaining some kind of help from the government now claim through the president of their association, J. Carson Adkerson, that some kind of an investigation has been made of their situation by a congressional committee. Just who made this investigation has not yet been divulged.

Domestic producers of manganese are perennial optimists; few industries put up so persistent and valiant a fight, and some day they may get somewhere because they are keeping everlastingly at it.

TELLS WHO BUYS MACHINERY

An interesting tabulation of the purchasing offices of the United States government both in Washington and in the field has just been compiled by the machinery division of the department of commerce.

The compilation was made at the request of many business firms who want to sell machinery and similar equipment to various departments of the government. Copies of the list may be obtained by communicating with the machinery division.

Activities of Steel Users and Makers

STEEL INDUSTRIES ENGINEERING CORP., Empire building, Pittsburgh, has just sold through its British representative, Ashmore, Benson, Pease & Co. Ltd., two electric rotary clay guns, one of which goes to the South African Iron & Steel Industrial Corp., Pretoria, South Africa, and the other to Richard Thomas & Co., England.

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Saw & Knife Specialty Co., Cleveland, has moved to new quarters at 6526-28 Carnegie avenue where larger facilities are provided for increased production.

♦ ♦ ♦

Herberts Machinery Co. Ltd., Los Angeles, has established an export department at 50 Church street, New York, to handle its growing trade in woodworking machinery to foreign markets.

♦ ♦ ♦

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has appointed Root Neal & Co., 64 Peabody street, Buffalo, distributor for welding equipment and accessories for central and western New York.

♦ ♦ ♦

Ashton Valve Co., 161 First street, Cambridge, Boston, has appointed the Steam Equipment Mfg. Co., Jenkins Arcade building, Pittsburgh, its distributor in the Pittsburgh district for valves, gages and other equipment.

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A. G. J. Rapp has acquired the interest held by C. D. Hollins in Rapp & Hollins Inc., foundry equipment, and will continue the business at the same address, 7001 North Clark street, Chicago. The name of the corporation has been changed to A. G. J. Rapp Inc.

♦ ♦ ♦

Wrought Washer Mfg. Co., Milwaukee, manufacturer of washers and stampings, through its Los Angeles sales agent, Western Washer & Mfg. Co., is expanding its service in California. The latter company is moving into larger quarters at 2111 East Fifty-first street, where cost-reducing machinery for production of washers is being installed and facilities generally enlarged. Additional warehouse space is also being provided.

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Kibele Mfg. Co., San Antonio, Tex., oil field supplies, has moved its offices and manufacturing plant to Dallas, Tex., where it has leased a portion of the plant of the Mosher Steel & Machinery Co. Robert A.

Wilson is president and general manager.

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Conemaugh Iron Works Co., Blairsville, Pa., filed voluntary petition in bankruptcy in the federal courts at Pittsburgh Aug. 11. The company shows liabilities of $659,999 and assets of $629,159. Of the liabilities, $575,875 are secured claims and $80,016.80 unsecured. Company's real estate is given a valuation of $586,104.

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Swann Chemical Co., Anniston, Ala., a subsidiary of Monsanto Chemical Co., St. Louis, has changed its name to Monsanto Chemical Co. of Alabama and its administrative and sales offices have been moved to the Monsanto building in St. Louis. Offices of the Provident Chemical Co., St. Louis, another former Swann subsidiary, have also been removed to the Monsanto building.

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Welding Timer Corp., Newark, N. J., has appointed Taylor-Hall Welding Corp, Worcester, Mass., its representative in New England and the Electroloy Co. Inc., Detroit, its agent at Detroit, Chicago and Cleveland, covering Michigan, Ohio, Illinois, Indiana and Wisconsin.

• • •

Cleveland Quarries Co., Cleveland, has appointed the Buckeye Silica Firestone Western Foundry Sand Co., 1043 Elliott avenue West, Seattle, representative for Oregon, Washington and British Columbia. The Cleveland firm also has designated the M. W. Warren Coke Co., 115 Miller street, St. Louis as representative for Missouri, Kansas, Oklahoma and southern Illinois.

• • •

Royer Foundry & Machine Co., Kingston, Pa., manufacturer of sand preparation and other foundry equipment, has appointed A. T. Wagner Co., 2700 Wight street, Detroit, and M. W. Warren Coke Co., 115 Miller street, St. Louis, as representatives in these territories.

• • •

E. F. Houghton & Co., Philadelphia, manufacturer of belting, lubricants, cutting oils and similar products, founded in 1865, is celebrating its seventieth anniversary this year. It began its existence in the investigations of E. F. Houghton into the possibilities of petroleum, broadened its field in 1870 when A. E. Carpenter became a partner, and was incorporated in 1910.

First Half Pig Iron Output, 1934-5, Presents Close Parallel

PIG iron production in first half of 1934 aggregated 9,709,899 gross tons, compared with 9,669,015 gross tons during first half of 1934, according to statistics of the American Iron and Steel institute.

Ferroalloy production for first half of 1935 was 257,790 gross tons and for the corresponding period of 1934 it was 257,941 tons. The combined total of pig iron and ferroalloys for first half of 1935 was 9,967,689 gross tons; in the same period of 1934 it was 9,926,956 tons. The figures present an unusually close total for the two periods, the gain in 1935 being only 40,733 gross tons.

With total pig iron production in last half of 1934 at 6,007,874 gross tons and combined pig iron and ferroalloys at 6,211,617 tons it seems entirely likely the present year will show a decided gain over 1934 as there is no sign of so great a second-half shrinkage as took place in 1934.

Ferroalloy production during first half of 1935, at 257,790 gross tons, was 151 tons less than was produced in first half of 1934. Of this total 168,083 tons was for sale and 89,707 tons for maker's use. This output included 136,246 tons of ferromanganese and spiegeleisen, 102,639 tons of ferrosilicon and the remainder other ferroalloys.

In these tabulations all pig iron and ferroalloys are included, whether made in blast or electric furnaces. Ferroalloys include ferromanganese, spiegeleisen, ferrosilicon (containing 7 per cent and over of silicon), ferrophosphorus, ferrovanadium, ferrochrome and others.

Other comparisons of production over first half of this and last year will be found in the accompanying tables.

FERROALLOY PRODUCTION

Gross Tons

	First half 1934	First half 1935	Last half 1934
Ferroman., spieg.	90,516	136,246	95,317
Ferrosilicon	150,438	102,639	89,527
Other ferroalloys	16,987	18,905	18,899
Total	257,941	257,790	203,743

PRODUCTION OF PIG IRON AND FERROALLOYS, FIRST HALF, 1935

For Sale and for Maker's Use

Gross Tons

	For sale	For maker's use
Pig Iron:		
Basic	344,778	6,125,444
Bessemer, low-phos.	129,314	1,949,511
Foundry	528,577	79,609
Malleable	434,878	104,191
Forge or mill	.....	31
White, mottled, direct castings, etc.	2,757	10,809
Total	1,440,304	8,269,595
Ferroalloys:		
Ferromanganese, spiegeleisen	53,350	82,896
Ferrosilicon	96,048	6,591
Other ferroalloys	18,685	220
Total	168,083	89,707
Grand total	1,608,387	8,359,302

Pig Iron Production by Grades, First Half, 1934-5

Gross Tons

	Basic, First half		Bessemer, Low-Phos., First half		Foundry, First half		Malleable, First half	
	1934	1935	1934	1935	1934	1935	1934	1935
Pennsylvania	1,708,437	1,552,713	766,525	892,212	231,512	126,628	148,166	152,087
New York	367,913	343,666	.....	.....				
Ohio	1,568,321	1,785,299	812,772	664,917	85,993	76,314	263,301	207,372
Indiana, Illinois	1,184,884	1,393,998	335,401	305,596	.....	.....	94,037	179,610
Md., W. Va., Ky., Ala.	1,044,459	1,006,298	.....	.....	.....	.....	.....	.....
N. Y., Md., W. Va., Ala.	.....	.....	277,157	229,100	.....	.....	.....	.....
Mich., Colo., Utah	373,678	388,248	.....	.....	.....	.....	.....	.....
Md., Va., Ky., Tenn., Ala.	.....	.....	.....	.....	320,437	312,093	.....	.....
Ill., Mich., Colo., Utah	.....	.....	.....	.....	53,745	93,151	.....	.....
Total	6,247,692	6,470,222	2,191,855	2,078,825	691,687	608,186	505,504	539,069

EDITORIAL

Isn't It Time To Quit This Anti-Business Foolishness?

APPROXIMATELY three months have passed since the Supreme Court handed down its decision against NIRA. Enough time has elapsed to afford observers a fair idea of the effect of the abandonment of codes.

President Roosevelt and other spokesmen for the new deal predicted that chaotic conditions would sweep the country. He pictured a return to low wages and long hours and to low commodity prices. On the other hand, business generally hailed the Supreme Court action as a stimulant of confidence, which would banish fear and in turn provide encouragement for industry to engage in long term commitments.

The experience of three months has proved that in the main the President and his advisers were wrong. In the majority of industries wages and hours have been maintained substantially as they were under the codes. In retail trades and to some degree in small industries the tendency toward lower wages and longer hours has been marked. However, as a whole, it would seem that the adjustment of wages and hours from a fixed, artificial basis to one that is more responsive to natural economic laws is taking place gradually and orderly.

Prices Steady Without Artificial Support As Code Abandonment Brings New Confidence

As for prices, there has been no noticeable tendency toward weakness during the three-month period. On the contrary, the tone of prices has been unusually steady. The index number of wholesale prices compiled by the government's bureau of labor statistics stood at 80.2 on June 1 and at 80.1 in the week ending Aug. 10. For commodities other than farm and food products the index number was 77.8 in the June week and 78.0 in the August week. The corresponding index numbers for farm products were 80.7 and 79.7. In short, prices now are at about the same level as when the NIRA decision was announced, and the trend is toward strength.

Volume of business since the decisions of May 27 has exceeded expectations. In the first few weeks after the codes were abandoned business activity lagged noticeably, due to uncertainty and confusion as to the real significance of the court's action. But as the public began to realize that the fundamental rights guaranteed under the constitution had been upheld by the Supreme Court, courage replaced fear. Shortly after Independence day, the revived spirit of confidence began to appear in many lines of business. A new interest in the rehabilitation of plant and equipment was manifested. Private funds began to come out of hiding.

As a result, industrial activity mounted steadily through July and August. This gain during a time of year when business normally is slack was significant. It marked the first, pronounced mid-summer gain since 1928 and it was accomplished in the face of malicious anti-business attacks by the government.

Business Recovery Will Be Greatly Hastened By Government Adopting Hands-Off Policy

It seems clear to everybody except the new dealers that business now is in a better position to stand on its own feet than at any time since the depression became acute. Business is like a convalescent patient who needs exercise to restore strength to his long inactive muscles. Under the circumstances, a wise physician would either abandon or gradually diminish the amount of medicine administered and more and more would give natural forces a chance.

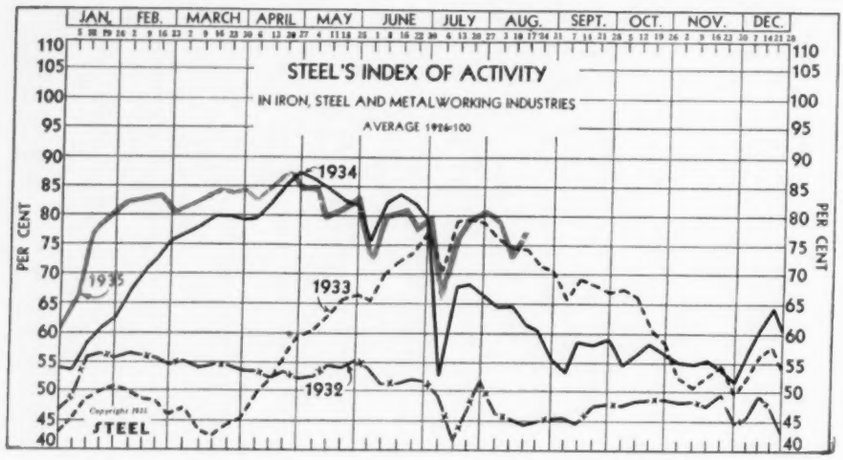
Unfortunately we see no signs of such action in Washington. The nation's physician seems to think that the patient still needs scores of untried remedies. He even insists that a few major operations, not to mention a number of amputations, will be in order. Apparently the good doctor is so fearful that his patient will get well that he is trying to think up new ways of keeping him in bed.

How much better it would be to let up on all of the foolish baiting of industry, the shallow pretense of helping the masses by sharing the wealth, the fraud of deluding the poor into thinking that the cost of new deal extravagance will be paid by the rich, and the ill-concealed effort to build up a permanent bureaucracy!

Is it not time to reverse the attitude of government toward business? Certainly it is infinitely easier to stimulate employment by encouraging private business than by attacking private business and at the same time throwing away hundreds of millions in leaf raking, boondoggling and questionable public works.

The pity of it is that the President's advisers will come to their senses too late. After the pace of business quickens to a gallop, the new dealers will abandon their campaign of hate and will jump onto the bandwagon. They will be whipping up the horses at just about the time when they should be putting on the brakes!

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained* 3.9 *points to* 77.3 *in the week ending August* 17:

Week ending	1935	1934	1933	1932
June 15	80.0	83.6	72.1	51.8
June 22	77.3	81.8	73.9	51.6
June 29	78.4	79.4	77.0	49.2
July 6	64.1	52.3	71.4	41.7
July 13	76.5	67.8	79.1	46.7
July 20	79.8	68.1	79.4	51.5
July 27	80.8	66.4	78.8	46.1
Aug. 3	78.4	64.6	75.9	45.1
Aug. 10	73.4†	64.6	74.7	44.6
Aug. 17	77.3*	61.4	74.2	44.9

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

Industry Gathers Strength For Further Advances

WITH September barely a week away, it is safe to say that business has passed through the dog days with only slight concessions to the normal mid-summer dullness. Except for a let-up of several weeks in the automobile industry, activity generally has been advancing steadily since the second week of July.

Throughout this period the strength of the business situation has been reflected most noticeably in the demand for materials and equipment. Steelworks operations, which constitute a reliable barometer of the consumption of basic materials for the metalworking industries, have mounted in six consecutive weeks from 31 to 51 per cent of capacity.

While this gain of over 60 per cent in steel operations is unusual for the ordinarily slack season of July and August, it is matched in degree and exceeded in significance by the recent spectacular rise in the demand for equipment. This is best illustrated by the gain in orders for machine tools.

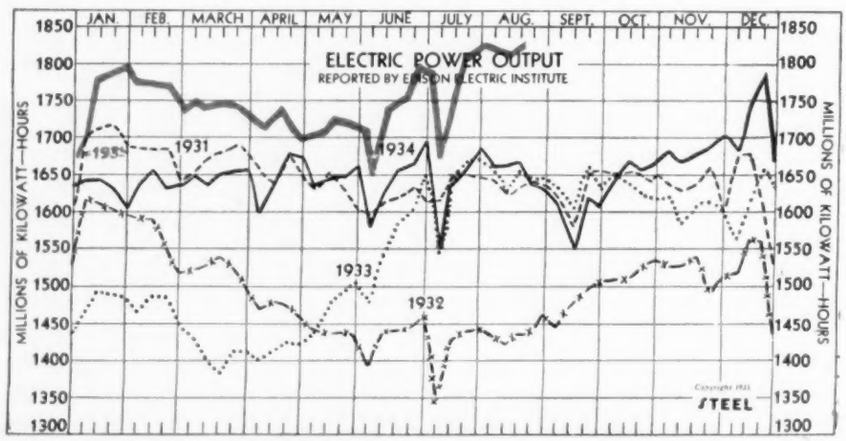
As indicated by the chart shown on this page last week, the three-month moving average index for machine tool orders in July was 94.7 as compared with 76.7 in June. The monthly index number gained more than 60 per cent in June and July. Shipments of machine tools are far behind new orders received. Unfilled orders are increasing. It is estimated that unfilled orders aggregate about twice the present rate of shipments.

This sharp gain in machine tool bookings is

Million Kw.-Hr.

1935

Aug. 17	1,832
Aug. 10	1,819
Aug. 3	1,821
July 27	1,823
July 20	1,807
July 13	1,766
July 6	1,655
June 29	1,772
June 22	1,775
June 15	1,743
June 8	1,724
June 1	1,629



Million Kw.-Hr.

1934

Aug. 18	1,674
Aug. 11	1,659
Aug. 4	1,657
July 28	1,683
July 21	1,663
July 14	1,647
July 7	1,556
June 30	1,688
June 23	1,675
June 16	1,665
June 9	1,655
June 2	1,576

typical of increased activity in many branches of the industrial equipment industry. It reflects the awakening interest in efficient production methods—always a forerunner of intensive competition in an expanding market.

The price factor will assume greater importance in the next quarter. Although prices of iron, steel and nonferrous metals and their products have been under heavy pressure since the codes were outlawed, base prices have stood firm in almost every instance. Some adjustments have been made through changes in extras, but in the main prices have withstood every attack strongly. Moreover, as the month of August draws to a close there are increasing evidences of new price strength. Copper and zinc quotations advanced last week. Steel scrap still is edging upward. The price of forging billets recently was marked up $3 a ton. Steel prices generally are strong on a broad, active demand.

Relating these encouraging factors to the fact that the automobile industry is in the process of resuming operations on a heavy scale, one finds ample justification for expecting a strong business situation after Labor day. Business sentiment is buoyant, and will be more so as soon as the relief from the adjournment of congress is more generally realized.

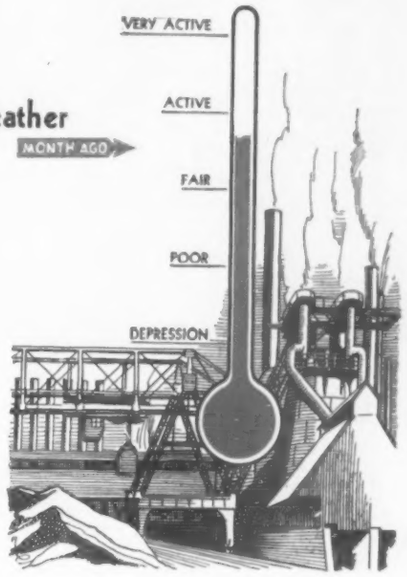
A remote factor—potentially important—is the possibility that a real war may grow out of the Italian-Ethiopian conflict.

Where Business Stands

Monthly Average, 1934—100

	July, 1935	June, 1935	July, 1934
Steel Ingot Output	107.5	109.8	73.3
Pig Iron Output	111.9	118.6	90.4
Freight Movement	94.1	104.3	99.3
Building Construction	.....	180.1	104.3
Automobile Output	145.0	156.3	114.4
Wholesale Prices	.....	106.0	102.2

Industrial Weather



TREND:

Upward

The Barometer of Business

Industrial Indicators

	July, 1935	June, 1935	July, 1934
Pig iron output (daily average, tons)	49,033	51,949	39,630
Machine tool index	94.7	76.7	38.6
Finished steel shipment (tons)	547,794	578,108	369,938
Ingot output (daily average, tons)	87,316	89,236	59,578
Dodge building awards in 37 states (sq. ft.)	.....	22,878,800	13,250,000
Automobile output	*350,000	377,065	277,689
Coal output, tons	24,869,000	30,264,000	25,280,000
Business failures; number	931	961	912
Business failures; liabilities	$20,446,761	$20,463,097	$19,325,517
Cement production, bbls.	.....	8,730,000	8,144,000
Cotton consumption, bales	.....	386,000	.....
Car loadings (weekly av.)	557,184	614,953	586,574

*Estimate.

Foreign Trade

	July, 1935	June, 1935	July, 1934
Exports	.....	$170,193,000	$161,787,000
Imports	.....	$156,756,040	$127,342,000
Gold exports	.....	$166,000	$114,000
Gold imports	.....	$230,538,000	$53,330,000

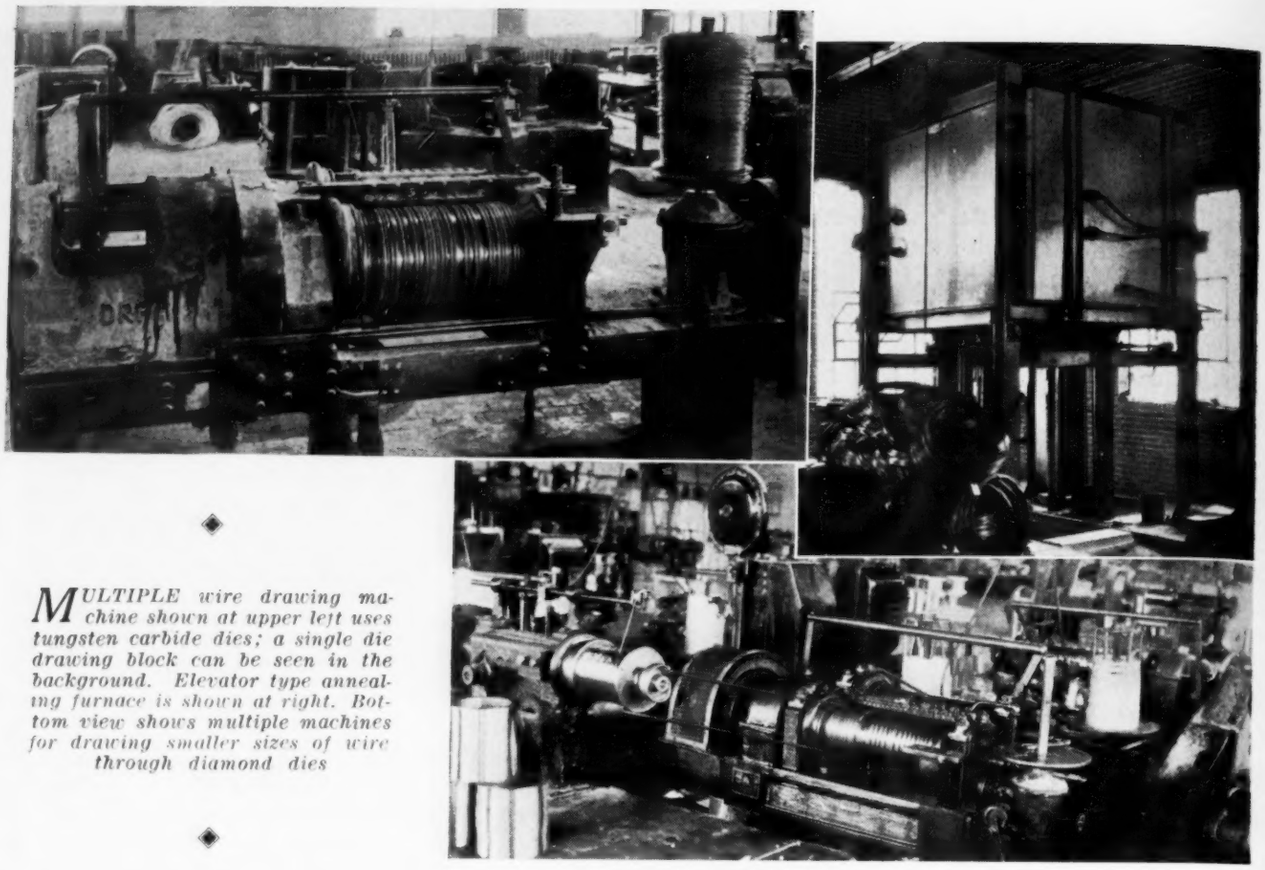
Financial Indicators

	July, 1935	June, 1935	July, 1934
25 Industrial stocks	$171.78	$161.44	$131.06
25 rail stocks	$26.05	$25.17	$31.06
40 Bonds	$82.36	$81.33	$81.55
Bank clearings (000 omitted)	.....	$20,399,783	$18,670,062
Commercial paper rate, New York (per cent)	1	1	1
*Commercial loans (000 omitted)	$7,327,000	$8,038,000	$4,445,000
Federal Reserve ratio, per cent	74.5	74.4	69.9
†Railroad earnings	$34,024,691	$39,505,068	$35,220,889
Stock sales, New York stock exchange	.....	22,339,512	21,115,884
Bond sales, par value	.....	$265,093,200	$264,604,200

*Leading member banks Federal Reserve System.
†June, May and June, respectively.

Commodity Prices

	July, 1935	June, 1935	July, 1934	Aver. 1913
STEEL's composite average of 25 iron and steel prices	$32.44	$32.42	$32.32	$26.32
Bradstreet's index	.....	$9.84	$9.32	$9.21
Wheat, cash (bushel)	$1.03	$1.00	$1.07	92c
Corn, cash (bushel)	$1.02	$1.01	71c	51c
Petroleum, crude (bbl.)	.....	98c	94c	$2.50



MULTIPLE wire drawing machine shown at upper left uses tungsten carbide dies; a single die drawing block can be seen in the background. Elevator type annealing furnace is shown at right. Bottom view shows multiple machines for drawing smaller sizes of wire through diamond dies

STAINLESS STEEL WIRE

Finds Diversified Uses; To Produce It Many Closely Controlled Operations Are Required

By J. K. FINDLEY
Ludlum Steel Co.

WHEREVER resistance to corrosion has been a factor in the life of metallic parts or articles, chromium or chromium-nickel stainless alloys have found an ever increasing field in the lengthening of their useful life. The application of these alloys to numerous wire products has added much to the life of these products and by so doing has not only lessened the ultimate cost of materials but has, in many cases, decreased the time lost in making periodic replacements.

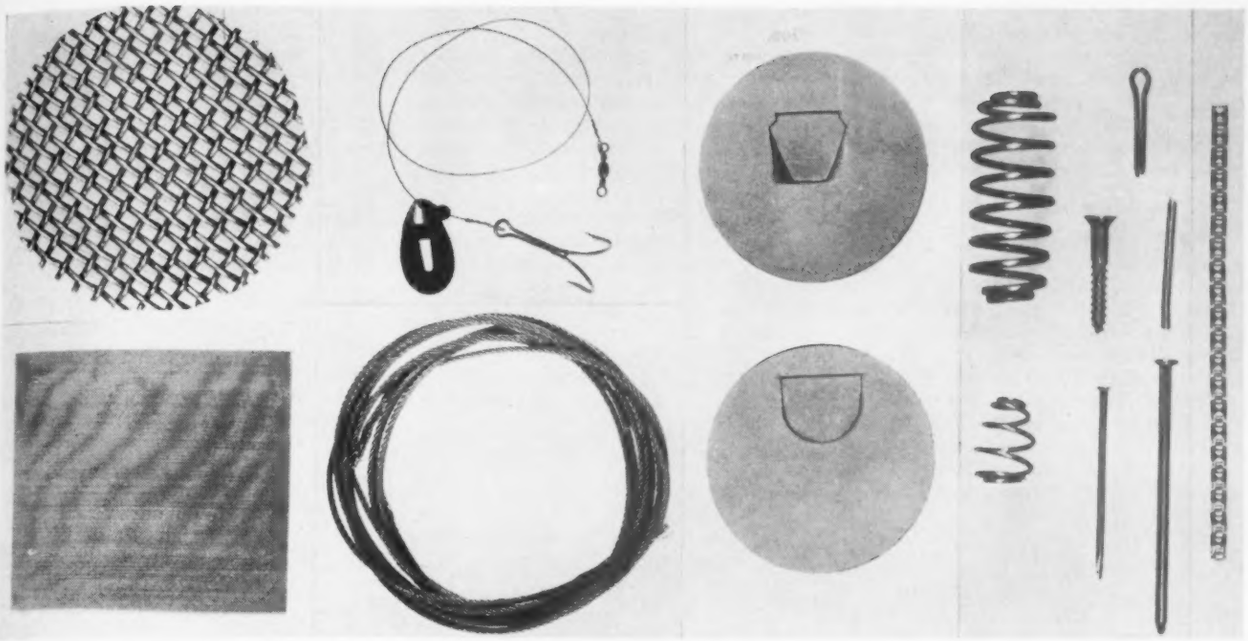
The largest uses for stainless wires have been in screens and wire cloth for the paper and chemical industries, wire rope and cord for yacht rigging and control cords on airplanes that must fly in salt water air, nails, screws, cotter pins, bolts and rivets subjected to corrosive acids or salt water, fishing leaders for sea fishing, springs that must withstand some temperature or corrosion, armature binding wire, welding rod, orthodontal wire, ornamental chain and braiding, and wire stitches in cardboard milk bottle caps.

Ludlum Steel Co. has been a pioneer in developing stainless wire for the uses mentioned above. In 1929 a new cold drawing department devoted entirely to the drawing of stainless wire, particularly in the finer sizes, was added to its Dunkirk mill. This department is equipped to handle wire from ¼-inch down to 0.004-inch rounds; however, most of the wire intended for fine wire is delivered to this department partly processed from the regular or older cold drawing department.

Initial Heat Treatment

Material for drawing in the fine wire department is received from the rod mill in the form of ¼-inch round rod in 50 to 60 pound coils. If the material is one of the chrome-nickel types of stainless it is first heated to 1900 degrees Fahr. in the elevator type furnace and quenched in water, but if the material is the straight chromium type it is annealed in iron pots at approximately 1500 degrees Fahr.

After this heat treatment the wire is pickled in 10 per cent sulphuric acid to remove the scale, washed with water, dipped in lime water and baked. The coils are now in condition for the first cold drawing passes. Three successive drafts on single hole machines bring the wire down to size 0.150-inch round. The coils are then ready for another heat treatment. While it is possible to draw the wire from ¼-inch round to sizes less than 0.150-inch



Many and varied are the uses of stainless steel wire. Shown in this view are heavy square mesh screen, fine mesh wire cloth, fishing leader, wire rope, wire stitch in milk bottle caps, screws, nails, cotter pins, springs and chain, all made of stainless steel wire

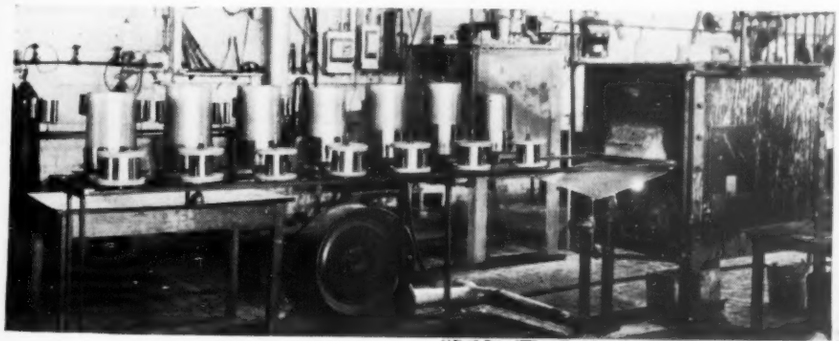
round without intermediate annealing, it has been practical to stop at this size, re-soften the wire and re-coat it for further drawing.

This is a repetition of the conditioning that was done on the ¼-inch rod except that the heating temperature is lowered to 1725 to 1800 degrees Fahr. on the chromium-nickel types and 1375 degrees Fahr. on the straight chromium types. The coils are then cold drawn three passes on single hole machines to 0.096 to 0.100-inch round and again re-softened, re-coated and cold drawn three passes on single hole machines to 0.050 to 0.055-inch round. The re-softening and re-coating is again repeated and the coils are cold drawn one pass to 0.040 to 0.038-inch on a single hole machine and transferred to a multiple die drawing machine which takes the wire through five dies to a size between 0.024 to 0.020 inch rounds.

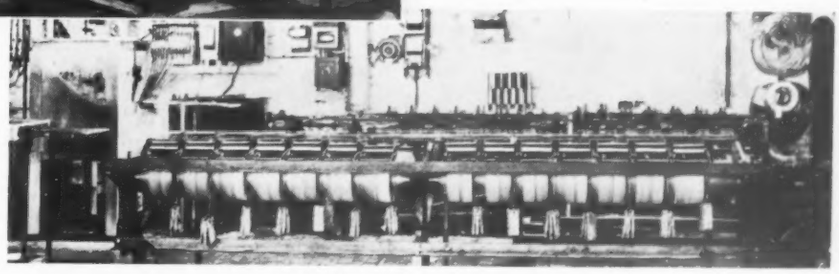
Preparations for Final Drawing

The coils now get their last processing heat treatment after which the scale is pickled off and after washing with water they are ready for final drawing in the multiple diamond die machines. The number of dies that the wire is drawn through in these machines depends on the finish size of the wire, the average being about 12 dies from 0.021 to 0.12-inch rounds. The wire is taken from these machines on spools or coils, as shown in the accompanying illustrations.

Bright annealing of fine stainless wire is accomplished by passing the wires single strand through tubular furnaces. The atmosphere in the tubes of these furnaces is pure hydrogen, consequently no oxidation takes place and the wire comes out of the furnace free from any discoloration although it reaches temperatures of 1950 degrees Fahr. while passing through the tubes of the furnace. The spools or coils of wire after the final cold drawing through the diamond dies are placed on pinions at the back of the bright annealing furnaces, the wires threaded through the tubes of



IN THE view at left, at the rear or entering end of two bright annealing furnaces, stainless wire is being taken from spools and drums



FRONT view of two bright annealing furnaces, with wire being spooled on gang spoolers, is shown at right

the furnaces and attached to the waiting spools on the gang spoolers, each spooler carrying fourteen spools, which is the number of tubes in each furnace. After spooling the wire is ready for final inspection of size, appearance, and physical properties, after which it is boxed for shipment.

Soft Annealed and Pickled

Procedure outlined above is used in making soft bright annealed weaving wire in sizes under 0.030 inch. In making soft annealed wire to finish in sizes over 0.030 inch the wire is drawn to one or two thousandths over the required finishing sizes, then given a final heat treatment in the elevator type furnace, after which it is pickled in sulphuric acid followed by a bright pickle in a nitric-hydrochloric acid mixture. It is finally dipped in warm dilute nitric, washed in water, dried, and is then ready for packing.

Spring and rope wire are made from the chromium-nickel type of stainless. The hardness and high strength on this wire is obtained only through cold working, therefore in producing these wires a large amount of drafting without intermediate annealing is necessary. The total draft is usually 94 to 95 per cent reduction in cross sectional area; for instance, size 0.028 inch rope wire would be drawn from 0.120 inch round annealed wire.

As in soft annealed wire the finish for sizes under 0.030 inch is bright diamond drawn and over 0.030 inch a pickled bright finish. This type of wire may be "scoured" or re-coiled by drawing through an emery lined rope after pickling to give more lustre to the finish.

Most of the dies used in processing the wire between ¼-inch round and 0.100-inch round are of the high carbon, high chromium steel type. Sizes between 0.100 inch and .030-inch round are drawn through tungsten carbide dies. Soap and lime are used as lubricants on the tungsten carbide dies. In drawing sizes between 0.030 and 0.020 inch either tungsten carbide or diamond dies, and under 0.020 inch diamond dies only, are used. The lubrication on the diamond dies is either oil or soluble oil and water.

The same factors which govern the resistance to corrosion of stainless sheets, strip, and bars apply to stainless wire, except in the case of hard drawn rope or spring wire of the chromium-nickel type where the resistance to the stronger corrosive agents is greatly reduced; however, its resistance to salt air and mild corrosive agents is not affected.

Wire for cold heading is either fully annealed and pickled or fully annealed and a lubricating coating applied by cold drawing the wire 0.002 or 0.003-inch. In the chromium-nickel type stainless, heading wire will show 90,000 to 110,000 pounds per square inch tensile strength and from 74 to 90 Rockwell B in hardness. The straight chromium types will show 75,000 to 85,000 pounds per square inch tensile and 78 to 90 Rockwell B in hardness.

Types of Weaving Wire

Most of the weaving wire is 18 per cent chromium and 8 per cent nickel, 18-8 with molybdenum, 18-8 with titanium or columbium, 25 per cent chromium and 12 nickel, or 25 per cent chromium and 20 nickel. This is furnished in the dead soft annealed condition and will show from approximately 90,000 pounds per square inch tensile on the larger sizes to 115,000 on the finer sizes. The hardness will show approximately 73 Rockwell B and elonogation in 10-inch gage length will average from 70 per cent on the larger sizes to 45 on the finer sizes.

The rope and spring wires are made from the low carbon 18 per cent chromium and 8 nickel type and will show tensile strengths from 250,000 pounds per square inch on the larger sizes up to 350,000 on the smaller sizes. The hardness of these wires is equivalent to 46 to 50 Rockwell C.

A portion of the die room in which dies are lapped after becoming worn. Dies for coarse wire usually are of high carbon, high chromium steel, while tungsten carbide or diamond dies are used for fine wire

Plunger-Hydraulic Elevator Is Operated Electrically

Warner Elevator Mfg. Co., Cincinnati, has developed a new elevator for residences which is operated electrically but by the plunger-hydraulic principle. With this unit there is no overhead machinery and no cables or chains to break as no overhead support is required to carry the machinery and load. Driving mechanism is in the basement and all weight is supported from foundations in the basement.

In this elevator the platform is raised and lowered by a heavy, vertical, tubular, threaded, drawn steel column which at all times acts as a support for the car. This supporting column or screw is driven by a self aligning, ball bearing nut on screw threads turned on the supporting column. The nut is driven by a double V-belt from a single-phase motor operating from the lighting circuit. The screw column is supported on a standard steel pipe braced by the first-floor joists but resting on a concrete footing at or below the cellar floor. The suporting column is filled with lubricating oil.

Accurate stopping is accomplished by a magnet brake applied to the rim of the operating nut but the angle of the screw is sufficiently low to stop and hold the car and prevent it from coasting should the current or brake fail.

Varied Technical Program Is High Light of A.F.A. Meeting

CONVENING in the Dominion of Canada for the first time in many years, members of the American Foundrymen's association attending the thirty-ninth annual convention at Hotel Royal York, Toronto, Aug. 20-23, centered their attention principally upon an unusually extensive and varied technical program.

In more than two dozen scheduled sessions, opportunity was afforded for discussing many problems pertaining to the steel, gray iron, malleable and nonferrous branches of the industry.

Gray Iron

EXCELLENT attendance marked the opening session on cast iron Tuesday morning. Hyman Bornstein, Deere & Co., Moline, Ill., presided as chairman, with V. A. Crosby, Climax Molybdenum Co., Detroit, as vice-chairman. Garnet P. Phillips, International Harvester Co., Chicago, described results obtained from impact resistance tests on alloy cast irons made in the cupola and in the electric furnace. Those indicated that in the case of irons cast gray, fairly high-carbon, nickel-molybdenum irons that may contain chromium, have good impact resistance properties. Highest impact resistance was obtained on irons cast white and converted to gray irons by annealing.

In the tests, transverse resilience correlated closely with impact resistance, and single blow impact tests made on machined bars apparently correlated more closely with transverse resilience than repeated drop test on unmachined bars. In discussing the paper, H. A. Schwartz, National Malleable & Steel Casting Co., Cleveland, pointed out that study of the data, giving proper consideration of the various components entering into the test, showed that the repeated drop impact tests would give a curve similar to that obtained with a single-blow test.

Heat Treating for Hardness

R. G. McElwee, Ecorse Foundry Co., Ecorse, Mich., spoke on the heat treatment of regular and alloy gray irons to obtain decreased or increased hardness, and of special irons which as cast have a white structure. Under the latter he described an iron containing 2.50 per cent carbon and 1.50 per cent silicon. Heat treatment of that iron at 1725 degrees Fahr. for 4 hours, cooling to 1325 degrees Fahr., and holding for 4 hours, followed by slow cooling to 1100 degrees Fahr., and air cooling will show about 55,000 pounds per square inch tensile strength with 12 to 15 per cent elongation. With other treatment the strength can be increased to 90,000 pounds per square inch with a reduction of the elongation to 4 per cent.

The paper of George Delbart, Etablissement Cail, Denain, France, was presented by J. S. Vanick, International Nickel Co., New York. The author discussed industrial application of an alloy iron containing 3.75 per cent manganese and 6.5 per cent nickel which is austenitic as cast, but after heat treatment and air quenching becomes martensitic. That iron as cast has a tensile strength of about 29,000 pounds per square inch and a brinell hardness of 150. Heat treatment at 1112 degrees Fahr., and air quenching increased the tensile to 46,000 pounds per square inch and the brinell to 420. The author stated that while steam engine valves and valve guides made from the alloy are in actual service, it is better fitted for heavy castings.

Cupola Discussion Is Lively

An animated discussion in which several speakers presented widely divergent views followed the presentation of a paper, "Relation of the Air Charge to Cupola Operation," by H. V. Crawford, General Electric Co., at the cast iron shop course session, presided over by Fred J. Walls, International Nickel Co., New York.

Using several slides, the author discussed the various reactions that take place within the cupola and showed how best to operate the cupola. He divided the cupola into zones and explained the functions and reactions in each, also how improper control of air supply coke and iron charges influence the thermal efficiency and consequently the efficiency of the cupola as a melting unit.

James T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala., claimed that some of the statements did not coincide with his experience. He maintained that the amount of air should vary with the height of the bed, and is not a factor of importance in relation to the thickness of coke between charges. In support of his contention, he claimed that by adjusting the bed and varying the volume of air he can regulate the speed of a cupola from 40 to 10 tons per hour, without any variation in metal temperature.

Discussion followed a question from the floor as to whether a higher bed is required to melt charges containing large amounts of steel. According to the views of several, the steel absorbs a certain amount of the carbon from the fuel, therefore a sufficiently large amount of coke should be charged to compensate for this loss. John Grennan, University of Michigan, Ann Arbor, Mich., presented a paper prepared jointly by himself and Prof. H. L. Campbell, showing the result of a series of experiments to determine the relative amounts of CO and CO_2 generated in a cupola under various operating conditions.

Refractories

AN INTERESTING session on refractories was held Tuesday night at 8 o'clock with C. E. Bales, Ironton Firebrick Co., Ironton, O., acting as chairman. In absence of the author, Mr. Bales presented C. L. Norton Jr.'s paper on "Some Uses of Insulating Fire Brick in Modern Foundry Practice." The brick described in addition to insulating properties also has refractory qualities and has been found useful in nonferrous melting units employing crucibles, and in steel casting annealing furnaces. It is claimed that fuel savings of over 25 per cent were obtained in brass melting units, and about 30 per cent in steel annealing when that type of brick was employed.

J. T. MacKenzie, in discussing the paper, pointed out that when insulating is considered that compromise must be made between refractories and insulation as it was possible to melt out refractories rapidly when too much insulating value was obtained. Some one inquired about use of insulation on cupola forehearths, and J. A. Bowers, American Cast Iron Pipe Co., stated that in his plant a 4½-inch refractory fire brick lining backed with semirefractory, insulating brick gave satisfactory results. In lining the forehearth, the insulating, refractory brick is laid up carefully, and dried thoroughly. Then the refractory brick lining is laid up breaking the points between the two linings, and then the whole dried.

Insulation Saves Fuel

E. G. Eggleston, Detroit Lubricator Co., Detroit, said he found an insulating lining comprised of a layer of diatomaceous earth followed by insulating brick, and the regular refractory brick gave good service. A. S. Nichols, Illinois Clay Products Co., Joliet, Ill., said that in insulated open-hearth furnaces the practice was to heat the face brick only to the same temperature as it would be

the case without insulation. That was accomplished by controlling the heat input, and resulted in fuel saving. Don Reese, Whiting Corp., Harvey, Ill., mentioned that through insulating pouring ladles, it was possible in malleable foundries to increase capacity of bull ladles from 500 to 1500 pounds without having trouble with cold iron. He also stated that a large cylindrical type holding ladle, 54 inches inside diameter, and 11 feet long with a capacity of 11,000 pounds which was insulated only showed a temperature drop around 50 degrees Fahr. from the spout temperature.

Bung Brick Spalls Less

A paper by L. C. Hewitt, Laclede-Christy Clay Products Co., St. Louis, entitled, "Malleable Furnace Refractories," was presented by M. A. Hosmer, Hunt-Spiller Mfg. Co., South Boston, Mass. It was pointed out that spalling resistance of bung brick has been improved, and side wall life has been increased through use of super fireclay brick and high temperature mortar. H. A. Schwartz, National Malleable & Steel Casting Co., Cleveland, in discussing the paper said that variations from shop to shop in life of different types of refractories possibly was due to melting procedures. In one, excessive temperatures might be the prevailing factor, while in another trouble from spalling may be encountered. Consequently, opinions on the value of the similar firebrick would not be the same.

Mr. Hosmer said he found that careful attention to laying up sidewall brick increased life considerably. He also said that good results were obtained by daubing up the slag line with a mixture comprised of finely crushed silicon carbide abrasive wheel stubs, firesand, and clay. J. M. Trantin, Jr., Youngstown, O., stated that in a small regenerative open-hearth furnace, he found that more satisfactory results were obtained with fire clay side walls and roof, than with silica or chrome brick.

Malleable Cast Iron

THE first session on malleable cast iron was held Wednesday morning with R. J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich., in the chair. E. G. Mahin, University of Notre Dame, South Bend, Ind., presented a paper written in collaboration with J. W. Hamilton, Bendix Products Corp., South Bend, on endurance limit of black-heart malleable. Results obtained indicate that the endurance limit of the iron examined was slightly above 30,500 pounds per square inch which is considerably higher than previously reported data. Mention was made in the paper that the rounded projections on the temper carbon in the specimens reduced stress concentrations.

A. DiGuilio, University of Michigan, Ann Arbor, Mich., said that that form would be dependent upon silicon content and heat treatment. H. A. Schwartz, National Malleable & Steel Casting Co., Cleveland, stated that perhaps the notch effect depicted by the temper carbon was not so important, and that the lower Young's modulus of elasticity may indicate lower stress concentration.

The second paper by F. B. Riggan, Stockham Pipe & Fittings Co., Birmingham, Ala., on production of cupola malleable iron, was presented by H. C. Aufderhaar, Electro Metallurgical Co., Chicago. Average tensile strength of that material according to the author was 48,000 pounds per square inch; yield point, 34,000 pounds per square inch, and elongation 9 per cent. Following the paper, H. A. Schwartz, presented the report of the committee on specifications which pointed out that due to conflicting opinions of members of A.S.T.M. committee A-7, little progress had been made in preparing specifications for cupola malleable iron for pipe fittings.

Materials Handling

MANY of the advantages to be derived from the mechanical handling of materials particularly in small and medium size foundries were outlined by E. W. Beach, Campbell, Wyant & Cannon Co., Muskegon, Mich. Contrary to a somewhat prevalent belief, mechanical methods of handling sand and other materials readily may be adapted to the requirements of the ordinary foundry making a special or a miscellaneous line of small castings.

As a typical example, he presented an illustrated description of the equipment and method of operation in a small foundry with a daily capacity of 7 tons of light gray iron castings. The equipment in this foundry cost approximately $12,000. Adoption of the equipment resulted in savings sufficient to pay off the cost in 3½ years. Among the savings listed was a reduction from 5 cars to 1½ cars of new sand per year. The equipment includes a monorail system, a number of sand buckets and a sand preparation plant. The monorail system is utilized to transport sand, castings and also hot metal from the cupola.

After the castings are poured they are dumped on a vibrating screen. The castings are removed and placed in metal buckets suspended from the monorail and taken to the cleaning room. The sand falls on a belt from which it is carried aloft and dumped in a storage bin. A measured quantity of sand from this bin falls into a muller where it is mulled for approximately 2 minutes. Any required amount of new sand, water or other material is added to recondition the sand for any given variety of castings. Sand from the muller is discharged into a bucket with a capacity of 1000 pounds. This is hoisted from the pit and then conveyed by monorail to any of the molding stations. The empty bucket is returned to the filling station. By a constant rotation of buckets the molders are supplied steadily. The molder opens a gate and the sand falls into his flask.

Mechanical Charging Pays

At the same session presided over by James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind., Don Reese, Whiting Corp., Harvey, Ill., presented a paper, "Mechanical Charging for Small Tonnage Foundries," in which he pointed to the entire feasibility of adopting mechanical charging methods and equipment to foundries melting as low as 3 to 5 tons per hour. The equipment may vary from a simple skip hoist to a more elaborate monorail system and the cost may vary from $500 to $10,000. Citing a typical example of a recent installation in a foundry melting 35 tons per day, he claimed that the savings effected in a 12-month period paid for the cost of $9000.

In this instance, several factors raised the cost. The cupola had to be moved back on a new foundation, the charging door was raised 7 feet and a runway built for the monorail. Under the old arrangement 5 men were required on the charging floor and two or three additional men were required in hot weather on account of the low head room. Under the new arrangement two men attend to all the charging. Further, after standards were established, these men required no supervision. Replying to a question, the speaker said that a high charging door effected a considerable saving in the amount of coke required. Speaking generally, the economies effected by mechanical charging are more noticeable in cupolas where the heats extend over a period of 4 hours or more.

Sand Research

EXPANSION and contraction of the sand in the mold when heated to a high temperature and then cooled, are responsible for cuts, scabs, rat tails and other forms of casting defect according to a paper by H. W. Dietert and F. Valtier presented at a sand research session presided over by H. B. Hanley, American Laundry Machinery Co., Rochester, N. Y.

The oral presentation was supplemented by a number of slides show-

(*Please turn to Page* 43)

METHODS AND MATERIALS

Working Postures Affect Quantity and Quality of Production of Workmen

THE postures of operators' arms and other body parts, whether in standing or sitting positions, should receive particular attention on the part of time study men, according to Dean F. W. Shumard, National School of Time Study, Norwalk, Conn.

The proper height of work, whether the operator is standing or sitting, should be about 2 inches below the elbow height, says Dean Shumard. If the machine or work is of such dimensions as to prevent this maintenance of height for all sections, then the mean section requiring the longest sustained effort as perhaps indicated by the longer time elements, becomes the basis for rest allowances. Elements for other sections which impose undue stretching, reaching and stooping, must also be rewarded by heavier time allowances.

If the work station requires continual standing on concrete or other types of unyielding floors, the operator should stand on a fabric mat or on a soft wooden subplatform to counteract the effects of vitality-reducing floors.

Valuable data have been collected in the past few years by industrial and medical experts that prove the wisdom of having bench, chair or stool heights carefully specified for the minimizing of fatigue. Their figures prove that production costs in many instances have been materially lowered by using benches and chairs that are of proper height and correct design.

The correct height and general design of a work bench should be determined by the kind of work to be performed on it and also by the average height of operators to be assigned to the bench. The height of benches should be from 29 to 39 inches as measured from the floor or subfloor to the top surface of the bench. The top surfaces should not be over 3 inches in thickness and there should be no interfering braces or supports that will prevent sitting operators from placing their knees well under the bench.

Sitting operators should rest their feet on a foot rest about 10 inches wide, which is installed in a tipped position to the lower part of the bench. The front edge of the foot rest should be about 10 or 11 inches from the floor and flush with the front edge of the bench. The back of the inclined rest should be about 2 inches higher than the front edge. This foot rest, if adjustable, can be modified slightly to suit the convenience of different operators.

The stool or chair used for sedentary operators should also receive attention. Professional chair makers

Ornate Steel News Stand

NEW outdoor news stand, of modernistic design, is manufactured by Herring-Hall-Marvin Safe Co., Hamilton, O. When the stand is not in use the display racks fold up so as to close it. Each of these units contains 916 pounds of cold rolled strip, 35 pounds of steel angles and a small quantity of stainless steel in the form of trim

who have made investigations of fatigue, supply industrial chairs having wooden, saddle-type seats with suitable back rests. The chairs are adjustable, ranging from 25 to 31 inches from floor to front edge of the chair seat. Where work is made up mostly of pressing attitudes, as when using screw drivers, electric drills, etc., the back edge of the chair seat should be raised enough to compensate for the strain of posture.

Standing or sitting positions are tiresome, if either is constantly maintained all day without change. An operation which requires alternate standing and sitting is the ideal combination of work to lower fatigue.

Where this type of combination of standing-sitting postures is not feasible, the time study man often can prescribe an incidental element of work in the cycle which requires the operator walking a short distance to obtain or to deliver small quantities of work or for tools. This type of incidental element on monotonous operations offers relaxation in the form of productive work instead of heavier rest allowances.

Wear and Corrosion Resisting Surfaces Provided by Boron Carbide Crystals

COLMONOY INC., Los Nietos, Calif., after more than four years of development work, announces two new methods of utilizing metallic boron crystals in economically preparing metallic surfaces for resistance to wear and corrosion.

By one method, known as "sweat-on," metallic boron crystals are mixed with sodium silicate (water glass), to form a stiff paste. The surface to be processed is covered with this paste to a thickness of 1/16 to ⅛-inch. Sufficient heat is applied from an oxy-acetylene torch, carbon arc or atomic hydrogen torch to sink the crystals into the parent metal. This method produces a relatively level surface that is impregnated with diamond-hard, non-oxidizing, corrosion resisting crystals which retain their identity and do not fuse into a solid mass.

"After such processing," says Miles C. Smith of this company, "the parent metal is free to expand or contract, be formed or forged, without disturbing the overlay.

Two Methods Are Available

"The second method, advised for use where it is necessary to have a very smooth or ground and polished surface, is designated as the Colmonoy 'cast-on' process. In this process, the metallic boron crystals are held in a matrix of nickel alloy which has a lower melting point than steel, approximately 2000 degrees Fahr., facilitating easy melting and pouring to fill any desired space between a copper or cast-iron mold and the metal to be processed.

"This cast-on overlay fuses to the parent metal sufficiently to form 100 per cent bond, has a hardness of from 58 to 60 on the Rockwell C scale and is not readily attacked by alkalis or acids. Its resistance to abrasion is quite phenomenal since the metallic boron crystals do not lose their identity in the alloy but are firmly held in the alloy matrix to function in accordance with their remarkable properties."

Alloyed Cast Irons Have High Corrosion Resistance

Similar to the stainless steels are the compositions of high alloy content nickel cast iron used today for corrosion and rust resisting applications. For good metallurgical reasons, their composition must be rather different from that of the 18-8 stainless steels and they usually contain copper in addition to nickel and chromium. A typical alloy is that containing 14 per cent nickel, 6 per cent copper, 2 per cent chromium, with suitable amounts of carbon, silicon and manganese.

S S S

Strip Steel Now Supplied With Striped Satin Finishes

Strip steel in a new and attractive finish has been developed by Acme Steel Co., Chicago, and is being marketed as Satinstripe. Its design is composed of stripes or patterns rolled into the steel by specially ground rolls. The new product is available in many different kinds of stripes which vary in width and depth. A few of them are shown in the accompanying illustrations. Even when chromium, nickel or color finishes are applied the design shows through clearly.

The new finish is recommended as both practical and smartly attractive for fabricated metal products over a wide range and particularly those designed in the modern manner.

S S S

Grinding Reduces Costs

Rotary surface grinders are being used for grinding miscellaneous sewing machine parts requiring accuracy and high finish. Grinding with the periphery of the wheel, these machines have not only given finishes which have eliminated polishing machines, but have reduced costs 85 to 90 per cent.

S S S

Spraying Retards Corrosion

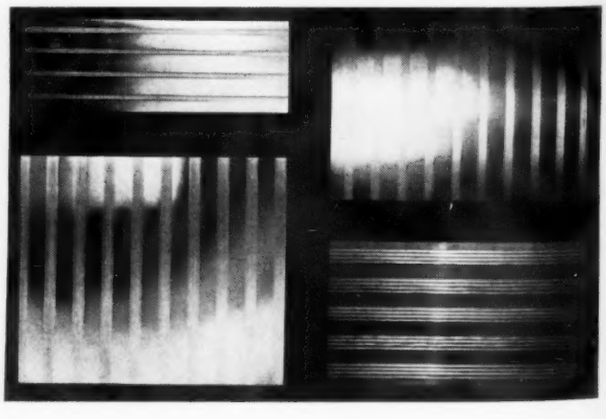
The manufacture of gasoline entails pressures of 800 pounds and temperatures of 900 degrees Fahr. with resultant reduction from corrosion of the steel wall structures of about ¼-inch per year. Oxyacetylene metal spraying is playing an important part in retarding this action. Four large refineries have sprayed several thousand feet of reaction chambers with aluminum during the past two years.

S S S

To Re-lubricate Bearings

When renewal of lubricants in antifriction bearings is necessary, a complete replacement should be made. When replacing oil, it is imperative that the system be drained and washed free of foreign material with clean kerosene. This should be followed by flushing out the system with a small quantity of the lubricating oil to be used.

In replacement of grease, care



A few samples of strip steel finished in striped patterns by aid of specially ground rolls

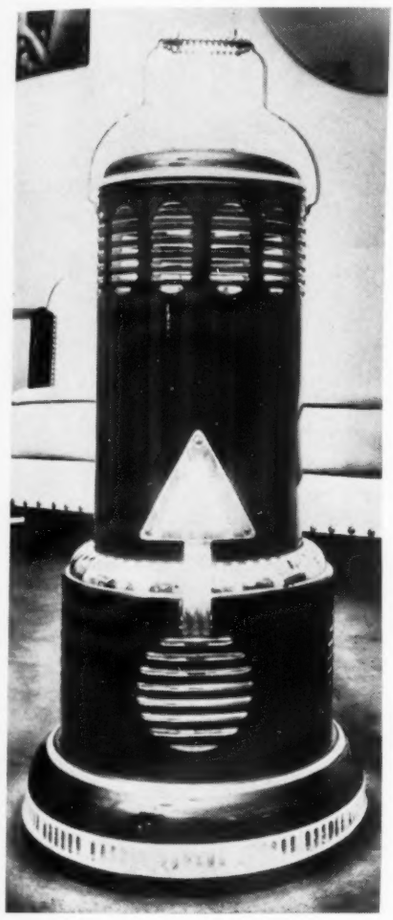
should be taken to clean out all of the used grease before introducing the new charge. Too often, when bearings are not readily accessible, periodic renewals and replacement of lubricants are neglected.

S S S

High-Speed Steel Treating

To slightly carburize and heat treat high-speed steel in the same operation, says one authority, the best method is to pack in a spent carburizer and heat up to 2100 degrees Fahr. followed by a strain relief treatment at light straw color.

A Stylist's Creation



NEW PORTABLE OIL HEATER, designed by Wilbur Henry Adams & Associates, industrial designers, Cleveland, and manufactured by Perfection Stove Co., Cleveland, represents an attempt to appeal to the increasing style consciousness of the rural housewife. Development of this heater is the result of a year's study based on the fact that the oil flame is susceptible to the slightest draft and temperature change. Precautions have been taken in the ventilation and draft provisions so as to make the heater serviceable and efficient in all climates, from the coastal states to the dry and arid regions. With modernistic lines are combined an all-black porcelain enamel finish with chromium plated trim

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

A Successful Industry

THE welding industry went as low in the depression as any industry which deals in capital goods, but it was the last to reach low and first to get out of the valley. The welding industry is at or above 1928 levels now.

Yet, not everyone who has been engaged in the industry has earned profits. From 20 years observation of the industry, the fact stands out that those who have succeeded "had somehing." In one case it was a patent; in another, a powerful distribution organization; in another, a smart manufacturing organization that could keep the costs down; in another, an executive who had an uncanny ability to do the right thing at the right time every time, and so on. In this respect it seems that business institutions are similar to individuals. The ones which succeed have something that sets them apart and gives them an advantage—some ability or distinction which is self generated.

The welding industry is now and always has been in free open competition and the devil take the hindmost. There are not the slightest indications that anyone can bring about a monoply. The welding business is founded on brains and inventive ability. It has occured to us to wonder if political government could have projected itself into the welding business and brought about greater progress or greater good for greater numbers. The brief effort with NRA was an absolute failure. Since that time not one suggestion has been made in the industry or by the government as to how the government could help the industry. The conclusion seems obvious. Only one thing remains to be done. Prevent political government from taxing the life out of the industry in an effort to perpetuate itself in fields in which its activity cannot possibly contribute to the general good of the people.

Age Hardening

A facetious young salesman asked a purchasing agent: "Would you like to buy some nice fresh steel this morning?" The purchasing agent replied: "No, thank you. I just bought some from your competitor. The last steel I bought from you must have been six months old." That was the first time the salesman had heard about the effect of age hardening on the deep drawing qualities of steel. While no organized effort has been made to determine the facts, there are reasons for believing that bare wire arc welding which has been mechanically worked by peening is subject to deterioration due to age hardening.

Sparks and Flashes

It has occurred to us that the automobile laundry might be a good place for the enterprising welder to practice his art of fixing things that come apart. It requires about 10 minutes for two big colored boys to wipe down a car after it has been washed. During this operation, a man with a gas torch and a small arc welder could get a good many things done, at say 25 cents a weld. In addition, he would be in a position to solicit longer and more expensive jobs from the owner, if there were such jobs on the car which needed to be done.

* * *

The copper-hydrogen process involves the heating of parts, closely held together, in a furnace with controlled atmosphere. Copper is applied to the joints prior to heating in the form of wire, powder or paste. In the presence of hydrogen and high temperature, an amalgamation takes place which meets any reasonable definition of a weld. The process is applicable to a good many jobs on which it is not at present used. In quantity production the cost of this method of making a weld is within economic bounds.

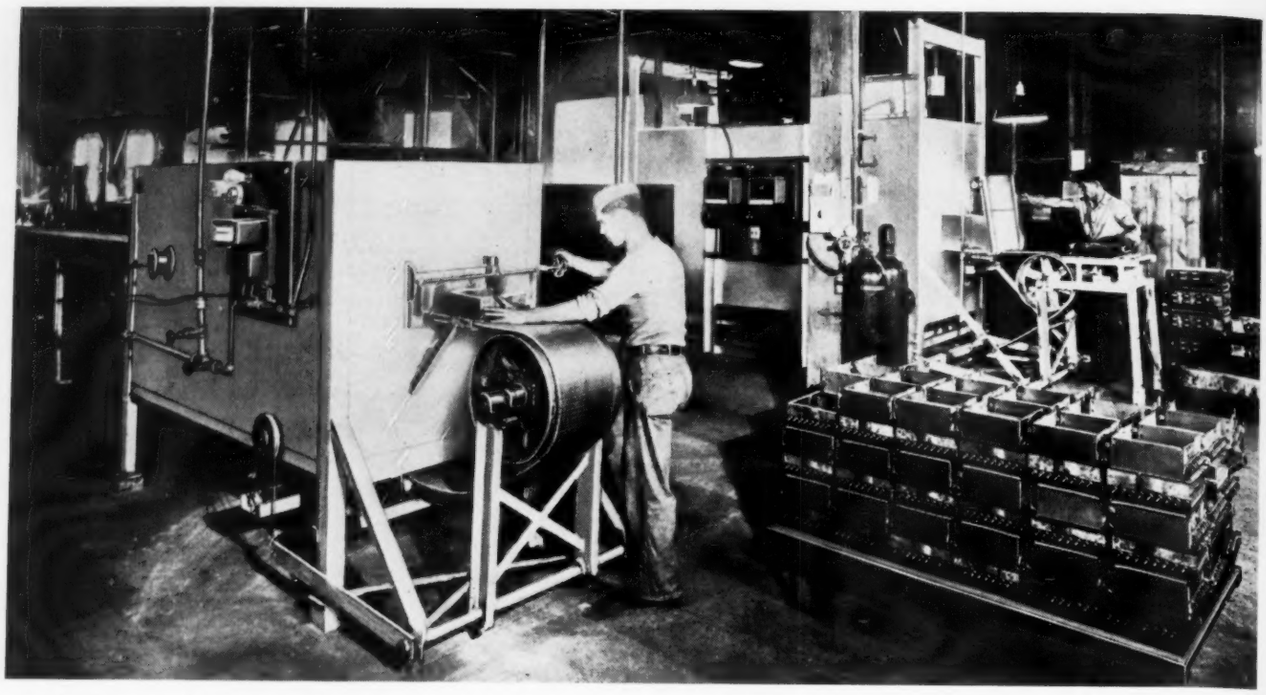


Fig. 8—Two mesh-belt, conveyor-type, controlled-atmosphere electric furnaces for copper brazing steel-fin refrigerator condensers

Metals Are Brazed in Controlled Atmosphere Electric Furnaces

Part II

BY H. M. WEBBER
General Electric Co.

WHY is it that electric-furnace brazed joints have great strength — sometimes so great that it equals the strength of the body metal? Let us investigate the situation briefly. First, we know that metals will grow together under pressure at high temperatures. For instance, stacks of steel sheets usually are "sticky" after annealing. It is almost impossible to anneal copper sheets in stacks, as they stick together so firmly.

Joining Metals by Pressure

To illustrate this growing together of metals, the writer once subjected a pair of small steel blocks to a pressure of about 100 pounds per square inch, and treated them with a long, slow copper brazing cycle. No copper was used, but the blocks grew together so solidly they could not be knocked apart with a hammer. The photomicrograph, Fig. 9, shows why. Note how the grains have grown together across the joint, forming a strong union between the two blocks. The photograph was taken in a spot where the joint was still in evidence, although most of the seam had entirely disappeared.

Some actual strength test data were taken in the National Cash Register research laboratory to illustrate this same effect. Small steel rods were pressed into holes in steel disks with such force that it would take 1500-3000 pounds per square inch (shear stress in the joint) to separate them. These samples were put through a typical copper brazing cycle without copper, after which they showed an average shear strength within the joint of 18,900 pounds per square inch—an increase of over eight times the original strength. From this it appears that tightly assembled joints favor the strength obtained in the electric furnace brazing process.

Brazing Action Explained

There is also another unusual effect, in which we observe that copper wets clean steel surfaces, flows readily, and creeps into and throughout tight crevices. At times we have seen it flow as much as two or three feet—upwards. Why does this happen? The explanation simply is that copper is slightly soluble in iron. As a result, the wetting action of the copper on the iron and the surface tension of the copper create a capillary force which draws the molten brazing metal into joints in steel assemblies, no matter how tight these joints might be.

The slight solubility of copper in iron is more favorable to the process than great solubility would be, otherwise the copper would go into the body metal rather than flow on

THE accompanying article constitutes the second and concluding part of a paper presented at the Tri-Chapter meeting of the Dayton, Columbus and Cincinnati chapters of the American Society for Metals held in Dayton, O., April 15. Part I appeared in the Aug. 12 issue of STEEL. *The author, H. M. Webber, is associated with the industrial department, General Electric Co., Schenectady, N. Y.*

its surface which frequently is the case when copper brazing high-nickel alloys such as monel metal, or when brazing copper parts with silver solder—examples where the brazing metal is highly soluble in the body metal.

From the equilibrium diagram of the iron-copper system, we know that molten copper can take into solution about 4 per cent of iron at 2100 degrees Fahr., most of which is separated out upon slow cooling. Also, iron can take into solution about 8 per cent of copper at 2100 degrees, most of which is separated out upon slow cooling. Thus, we have copper within the joints absorbing iron, and we have the abutting steel surfaces within the joints absorbing copper — effects which are more apparent in Fig. 10, and effects which result in strong bonds as subsequent data will prove.

The photomicrograph, Fig. 10, shows a copper-brazed joint between

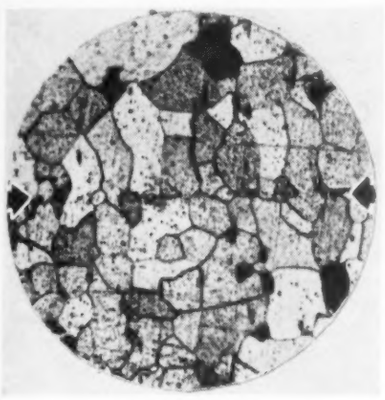


Fig. 9—This photomicrograph shows steel surfaces which have grown together under pressure at a temperature of 2100 degrees Fahr. They were not copper brazed. The joint is still in evidence as indicated by the arrows

two tightly assembled pieces of low-carbon steel of slightly different analyses. The darkened areas on the sides of the joint indicate how the copper has penetrated along the grain boundaries of the steel, and has gone into solution with the steel. The dark globules in the band of copper-rich alloy across the middle of the field are obviously the iron-rich phase which has separated out upon cooling, plus whatever natural grain growth that might have taken place across the joint. In any event, when trying to justify high strength, we see the copper firmly locked into the steel, and we see the two steel surfaces practically knitted together.

Copper-Iron Has Great Strength

We know also that the copper-iron alloy is stronger than pure copper. For instance, work by Hanson and Ford shows that the tensile strength of the rolled and annealed alloy increases 52 per cent, or from

FIG. 10—Photomicrographs of a copper brazed joint between two pieces of steel of slightly different analyses. The combination of copper penetrating into the grain boundaries on the sides of the joint and the growing together of the grains has practically knitted the two surfaces together

32,500 to 49,500 pounds per square inch, as the iron content goes up from 0.06 to 2.09 per cent. This maximum strength of 49,500 pounds per square inch takes on real significance when compared with the tensile strength of annealed copper and annealed low-carbon steel—30,000-35,000 and 50,000-55,000 pounds per square inch, respectively.

At this point we can best appreciate the results of strength tests on copper brazed test specimens, prepared and brazed under laboratory conditions. Many tensile test samples have been pulled in our laboratories, and it is not uncommon to have them break in the steel rather than in the brazed joint. However, this requires ideal conditions and we do not generally count on such strength in production. In production, under good supervision, 40,000-45,000 pounds per square inch tensile strength in low-carbon copper brazed assemblies is a reasonable range of values to expect.

The best data the writer has found on the shear strength of copper-brazed joints come from the National Cash Register research laboratory, where Messrs. Oswald and Homan have made a most interesting series of tests. They have shown that the greatest strength can be obtained with tight joints, although extreme pressures do not help materially. Also, a snug joint is considerably stronger than a loose joint with 0.003-inch gap.

Tight Joints Are Strongest

The latter was shown in one test with a series of low-carbon copper brazed samples. The snug joint gave a shear strength of 29,000 pounds per square inch, while the loose joint gave only 22,700 pounds per square inch. It is interesting to compare these test values with the shear strength of annealed copper, about 20,000 pounds per square inch, and that of annealed cold rolled iron, about 33,000 pounds per square inch.

Samples of S.A.E. 1010 carburizing stock, assembled with press fits

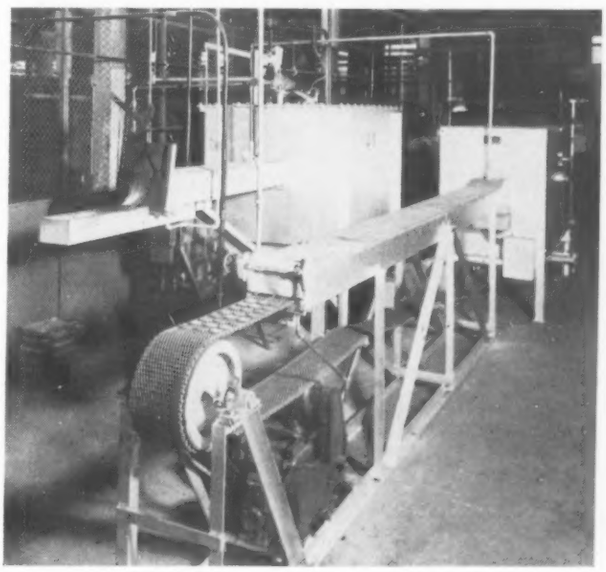


FIG. 11—Mesh belt, conveyor-type furnace (right) and box-type furnace (left) for copper brazing cash register parts

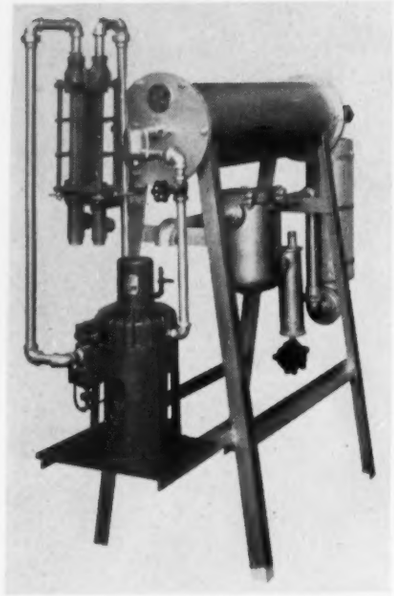


Fig. 12—Combustion-type atmosphere controller for reforming natural gas, coke-oven gas, butane or propane, to be used in controlled atmosphere brazing furnaces

and copper brazed, were heat treated. The results showed that heat treatment of this steel detracts somewhat from the strength of the brazed joints. In general, the more drastic the treatment the greater the reduction in strength. In spite of this fact, however, the strength of the heat treated brazed parts is still greater than drilling and pinning.

Other tests, on samples made of carbon and alloy steels copper brazed and heat treated, gave strengths ranging from 34,800 to 52,800 pounds per square inch. The lowest values were obtained with S.A.E. 6140 chrome-vanadium steel, while the best results were with S.A.E. 4615 nickel-molybdenum steel.

Effects of Alloying Elements

Among the metals used in parts fabricated by the electric furnace brazing process, low carbon steel is by far the most common. Various carbon and alloy steels are brazed with comparative ease. Nickel is particularly good as an alloying element, because of the great attraction of this element for copper. Chromium in concentrations of more than 1 per cent usually requires that a flux be used, and other special precautions sometimes are necessary to make copper wet high chromium steels. Aluminum and silicon also are troublesome constituents, because they, too, form oxides with the impurities in the furnace atmosphere which cannot be reduced by the so-called reducing gases in the atmosphere.

Nonferrous metals also are being electric furnace brazed. In such cases, it is of course necessary to choose a brazing metal which melts at a lower temperature than the body metal. Nickel-silver, copper, bronze, brass, etc., are in this group of metals which can be brazed with low-melting alloys. With these body metals, best results are obtained when the brazing metal is required to flow only short distances, because of its strong tendency to go into solution with the body metal.

When steel parts are electric furnace brazed, copper is the brazing metal most commonly employed. Nickel-silver, brass, bronze, silver-solder, etc., are also sometimes used as brazing metals. The low-melting brazing alloys generally require a flux, although the flux sometimes can be avoided where the brazing metal is confined within the joints during the assembly of the parts. When brazing with the alloys containing zinc, best results are obtained where the parts and their supports, such as the trays or conveyor in the furnace, are sufficiently light to permit quick heating. Otherwise zinc distills out, which raises the melting point and hinders or prevents flow of the brazing metal.

When brazing steel with copper there is some enlargement of grain size, due to the high-temperature treatment. For most applications this is not objectionable. There are cases, however, in which it is desirable to have a fine grain structure. Reheating through the critical with a regular normalizing or hardening cycle, or both, generally will refine the grain.

That this can be done is shown by the four photomicrographs of S.A.E. 4130 chrome-molybdenum steel in Fig. 13. At the upper left is a sample in the annealed "as received" condition. At the upper right is the same steel after passing through a mesh-belt copper brazing furnace. It moved continuously through the heating chamber in 12 minutes, the maximum temperature being 2060 degrees Fahr. (1125 degrees Cent.). At the lower right is the copper brazed sample after being normalized, hardened and drawn; note how the grain has been refined. At the lower left is shown the heat treated condition of the "as received" sample. It is interesting to observe that substantially the same ultimate structure is obtained after

(*Please turn to Page* 50)

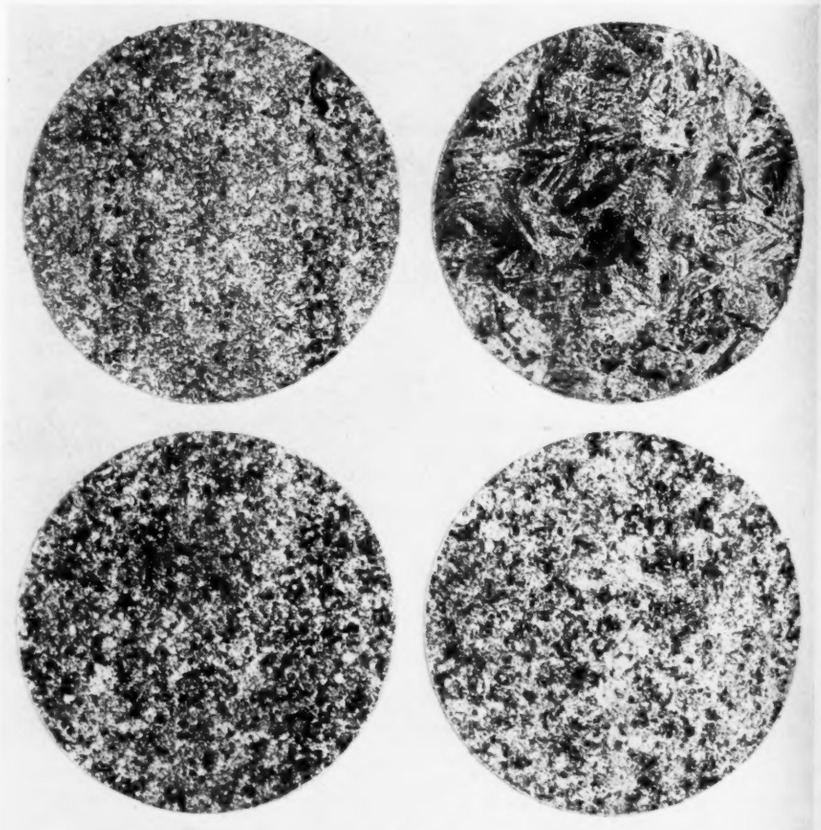
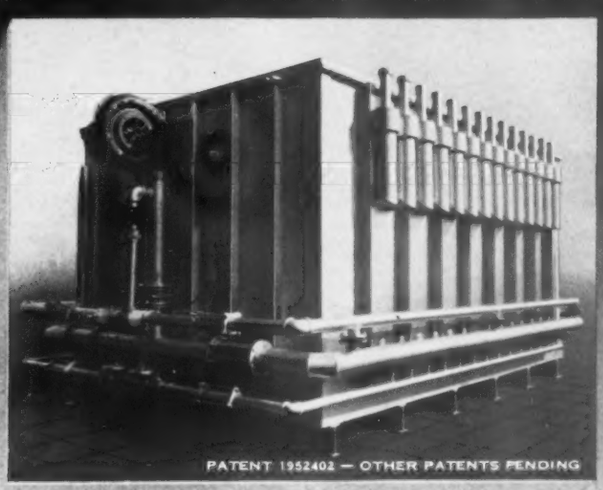


Fig. 13—Photomicrographs showing effects of electric furnace brazing and heat treating S.A.E. 4130 chrome-molybdenum steel. All magnifications are 75 diameters. (Upper left)—Sample in as-received annealed condition. (Upper right)—Sample copper brazed at 1125 degrees Cent. in 12 minutes. (Lower right)—Preceding sample heat treated, showing refinement of grain. Normalizing treatment: Heated 930 degrees Cent., 30 minutes; air quenched. Hardening treatment: Heated 850 degrees Cent., 15 minutes; water quenched. Draw: Heated 650 degrees Cent., 1 hour. (Lower left)—As-received sample heat treated. Normalized, hardened and drawn by same treatment given sample at lower right



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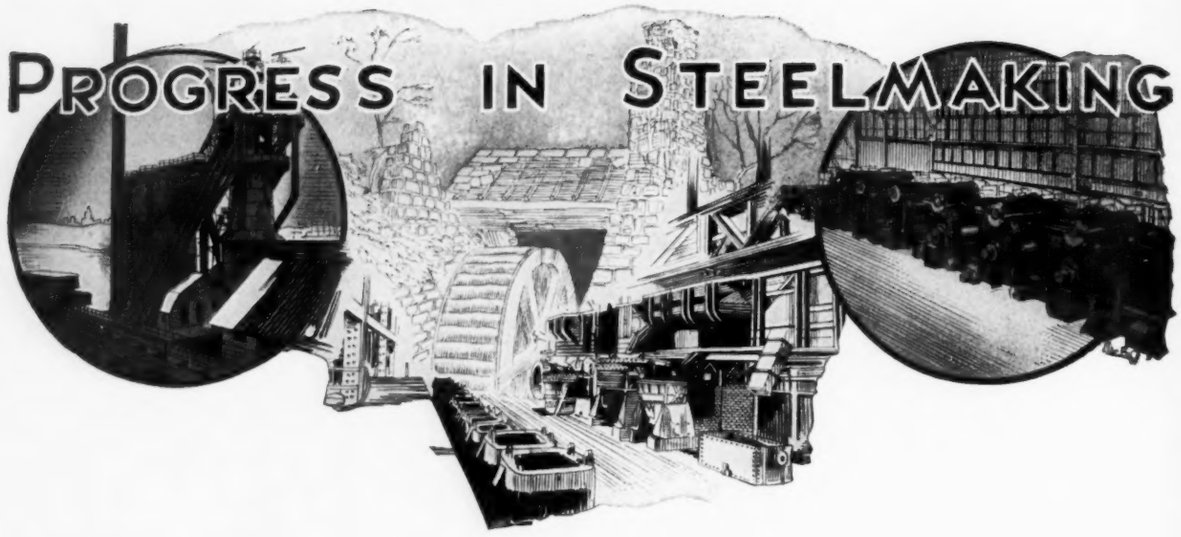


Shear Resistance Is High

Efficient service where a high strength ratio in relation to weight is required such as engine beds, underframes and rivets for boilers and pressure vessels is afforded by a high temperature resisting steel containing 0.5 chromium, 1.25 manganese and 0.75 per cent silicon. Rivets made of this grade of steel are tougher than ordinary good quality rivets. Their shear resistance is high, no special precautions have to be taken by the riveters and they can be chipped and caulked in the cold state. The effect of silicon is to raise the yield point without impairing the machinability. Manganese increases the tensile strength. Chromium increases both effects without detriment to toughness and ductility.

♦ ♦ ♦

Coating Is Scratch-Proof

Strip steel, sheets, screws, bolts, tools, machine parts, hardware, etc. are given a lustrous black finish by a recently announced process which utilizes an aqueous bath at low temperature and requires no plating, spraying or baking. The bath is prepared by dissolving special salts in water at room temperature and then heating to 275 to 293 degrees Fahr. The work free from all oxide or rust is immersed for about 5 minutes, removed and rinsed. The finish becomes part of the work and will not chip, peel, scale or discolor; it also is scratch-proof. The work can be stamped and shaped without impairing the surface finish. The finish can be applied to work having a high polished surface without dulling the luster. It is claimed to give protection against rust on articles intended for indoor use; for exterior use, a final application of oil or wax emulsion is recommended.

Three Money-Saving Ideas

Inspection of roller bearings is accomplished easily by placing the bearings on a shallow pan where most of the grease can be removed as soon as they are taken from their chocks. The bearings then are placed in a tank containing a solution of washing compound such as trisodium phosphate, using about 3 to 4 ounces per gallon of water. Agitating the solution by live steam greatly improves the cleansing action. This treatment, according to an authority, cleans the bearing thoroughly and permits a satisfactory inspection.

♦ ♦ ♦

Oxidation or tarnish can be removed from tin plate and other tinned metal and the original luster restored by a simple method. The work is immersed for two or three minutes in a bath of palm oil heated to 300 degrees Fahr. Upon removal the oil is allowed to drain off and this may be hastened by blowing the surface with an air blast. If the work is large it is best to preheat it in superheated water before immersing in the palm oil. By this arrangement the oil will drain from the surface quickly and will not leave a waxy deposit. Good results also may be obtained by another method which involves immersing the work, which has been preheated, in a 2 per cent solution of nitric acid. The length of time the work is in the acid depends upon the thickness of the oxide and must be determined by trial. If the dip is too short the luster will not be restored; if too long, the tarnish increases and results in the formation of spangles. Upon being withdrawn from the acid bath the work is rinsed in kerosene oil. Heated saw dust then is applied to the surface to remove the excess oil.

♦ ♦ ♦

Attaching paper to the drawing board is accomplished easily by the application of decorator's tape such as that used by painters for masking purposes. By this arrangement thumb tacks are eliminated, holes in the drawing board prevented and the paper is free of projections. The tape is removed easily.

♦ ♦ ♦

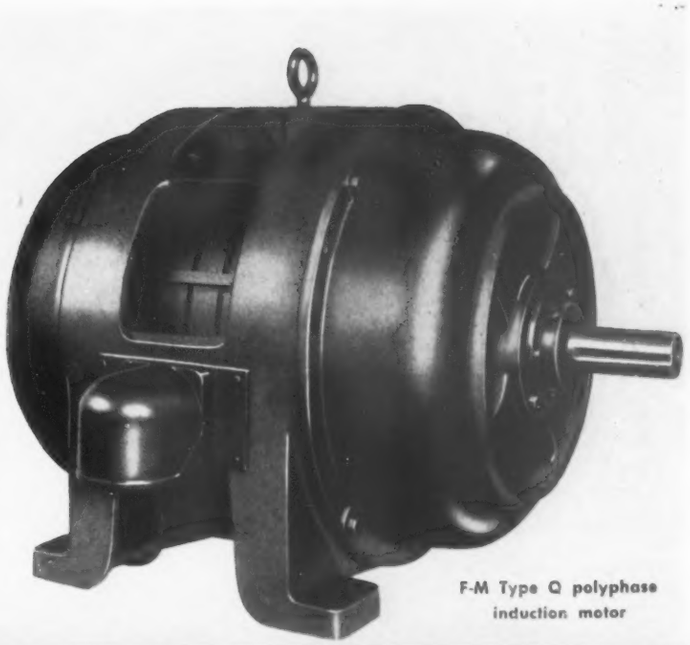
Reclaims Exhaust Heat

An eastern steel plant has placed a waste heat boiler at the exhaust end of a gas engine operating on blast furnace gas. Although such installations are not novel in Europe, this is said to be the first of its kind in the United States.

♦ ♦ ♦

Recommends Slow Pouring

Pouring riser heats at the rate of about 40 pounds per second using a 1½-inch nozzle results in a particularly good surfaced ingot which will produce sheets practically free from blisters, according to experiments conducted in South Wales. Tests disclose that freedom from blisters and other defects of sheets rolled from a slowly poured ingot is due entirely to the extra thickness of skin it possesses over ingots poured at the rate of 65 to 75 pounds per second.



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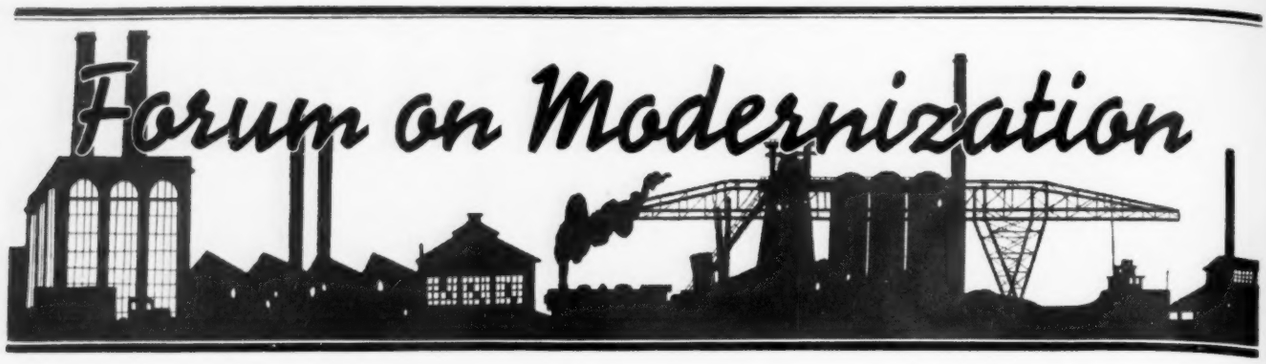


Design and Construction Improvements Outmode Old Forging Hammers

BY EUGENE C. CLARKE
President, Chambersburg Engineering Co.,
Chambersburg, Pa.

TO INSURE the utmost in productive economy it is necessary that stock delivered to machine tools be uniformly exact in form, dimension and material. Drop forgings, the stock for so many parts, become of primary importance in practically all metalworking industries.

In the past few years, particularly in the last three years, greater advance has been made in the refinement of drop forge production equipment than in the several preceding decades. In forgings, the reduction of allowance for finish, the closer tolerances on form and size, the better grain flow control, and the greater production at reduced costs, all due principally to advances in hammer design and construction, contribute to the more efficient performance in subsequent operations. Therefore, no manufacturer of drop forgings—or of any hammered forgings—can afford to operate hammers which have been made obsolete by present-day developments.

Conducted Slow Motion Studies

The greatest advance undoubtedly has been in the design and construction of steam drop hammers—equipment in which motive power is steam or compressed air. At Chambersburg, extensive studies by means of slow motion photography were made in order that more exact knowledge might be obtained of what happens to a piece of forging stock at the instant of impact. Based on these studies there was obtained an exact knowledge of the means of improving the operation. The result is the development of an entirely new cylinder and valve mechanism which is available in the hammers we are producing today.

The speed of impact is controlled to obtain the ideal where maximum of plastic flow is reached and destruction of the forging avoided. The speed of the ram away from the forging after impact is so rapid that the explosive action of the gases confined between the forging and the die "blow out" the forging. The immediate benefit is a reduction of required draft angle on the forging, smaller stock, and less excess material for finish. Two plants are now producing under these new Chambersburg hammers crankshafts with 3 degrees draft in place of the 7 degrees formerly used.

Astounding Increase in Die Life

Controlled speed at impact also means that a forging is finished with fewer blows, and consequently with less drop in temperature. The resulting increase in die life is astounding; and with the probability that skilled die sinkers will be at a premium when business ever approaches normal, any means of increasing die life is an important factor in maintained production as well as in costs.

At the same time great power economies are available in these new hammers. With the refinement of the cylinder and valves a higher mean effective pressure in the cylinder results. Savings as high as 40 per cent in power are not unusual.

As an example of what these savings mean, three of these new Chambersburg cylinders applied to three old model flat die forging hammers in an eastern steel plant paid for themselves in a few months by power saving alone.

Metallurgical and structural improvements have kept pace with these developments. Greater rigidity has brought about greater accuracy in forgings. Advantage has been taken of metallurgical progress to insure such continuity of operation as practically to remove the hammer from the class of "self destructive" tools. Alignment is maintained without frequent adjustments increasing the daily output by a percentage which may easily mean the difference between red and black in the ledger. This has been furthered by the development of Cecolloy, a series of nickel-molybdenum air furnace iron alloys, to absorb shock with the minimum of vibration.

Board Hammers Completely Revised

The construction of board drop hammers—those striking by gravity with mechanisms to lift the ram by means of rolls and a set of boards—has likewise been completely revised as a result of research undertaken at Chambersburg.

Perfect synchronism of rolls, heavier and more rigid construction, and metallurgical research have resulted in definite increases in production, in die life, and important reductions in cost along with greater accuracy and less miss-match. One installation of new motor driven, geared head hammers quickly demonstrated a 31 per cent increase in production, practically eliminated scrap and doubled die life. Another user of these new tools reports operating cost lower than that of any other hammer equipment in his shop, including many of smaller capacity.

Conclusions are obvious. Those forge shops which are modernizing their hammer equipment will enjoy lower cost forging production, together with economies in subsequent machining operations. Such shops set the standards for competition by actual performance. All hammer

equipment, regardless of age, must, therefore, be studied to determine its producing value and the marketability of the forgings it produces as compared with the high production and extreme accuracy of modern hammers. Such study will prove that the earning capacity of the present-day hammers places them in the front rank of investments.

Productivity of Machine Tools Is Advanced 50 Per Cent in Decade

BY W. E. WHIPP
President, Monarch Machine Tool Co., Sidney, O.

THE most welcome visitor we have at our plant is the sales engineer who says, "With your help and permission I would like to make an analysis of such-and-such manufacturing operations in your shop, to see whether or not our improved machines and methods will save you money." We give that representative all the help we can, and if he "shows us" he will likely get an order.

We feel that machine tools have advanced in design and productiveness during the past ten years almost on a par with the automobile, refrigerator and other things we use daily. Suppose we were about to buy a new automobile or an electric refrigerator and we called on a dealer who showed us a machine ten years old that had never been used, that had been sealed up in a glass case for the past ten years, that was the recognized leader in its line, the finest thing produced, measured by all standards of ten years ago. Now just what would any of us pay for such a machine. We wouldn't pay anything for it. We simply wouldn't have it. It is wholly obsolete as measured by today's standards.

Where Saving Is Poor Economy

Yet many of us who would refuse the gift of a new ten year old automobile or electric refrigerator will refuse even to consider replacing obsolete machine tool equipment, the average age of which is in most instances much more than 10 years. We say, "Why should we spend money for new equipment, the old machines are still running, they aren't worn out, we will wait until they wear out before we buy new ones."

The point is that if there are machines now available that give 25 per cent more and better production, that manufacturer is paying for the new machines in increased costs, lower net profits, and a poorer competitive position in his field, and he does not have the new machines to show for his expenditure.

It is safe to say that the machine tool of today will on the average produce upward of 50 per cent more than the same machine would produce as designed and built 10 years ago. In most instances lathes of today's design will produce double the work and of better quality than the best lathes of 10 years ago. We are accustomed to think of the lathe as the single tool, one operator per machine, "cut and try," small quantity run machine, an evil but a necessary one.

Status of Lathe Has Changed

The modern lathe is not necessarily a single-tool single-operator machine. Hundreds of lathes with automatic stops and multiple tools, one operator handling two or more machines, are cutting production costs in shops today. No longer is the lathe the "cut and try" machine it was 5 or 10 years ago. New methods of tool setting on lathes together with direct reading micrometer dials, save the operator's time, prevent spoiled work, and lower production costs.

Antifriction bearings, automatic lubrication, better gearing, heavier construction and the use of improved materials enable the modern lathe to handle the new cemented carbide turning and boring tools on many classes of work, showing a tremendous increase in production. Executives should consider modern machine tools from an investment standpoint, and carefully check the lowered costs and the better quality of output as compared to that now obtained.

Sand Research Discussed by A. F. A.

(*Concluded from Page 32*)

ing laboratory equipment for sand testing in this particular field of activity, charts showing the behavior of various grades of sand under different ramming and temperature conditions and reproductions of photographs of surface defects on castings directly traceable to the phenomenon of expansion and contraction of the sand. Naturally, hard-rammed sand resists contraction and expansion more than soft sand. Bond, permeability, moisture content, grain size and density of ramming constitute important factors in any investigation dealing with this subject.

Dr. H. Ries, Cornell University, Ithaca, N. Y., presented a report covering the past, present and future activities of the sand testing committee. The work first was undertaken by the American Foundrymen's association about 15 years ago and while a considerable amount of progress has been made the field constantly has expanded in directions beyond all original anticipation. As a result, the committee has become increasingly cautious in arriving at conclusions or in recommending tentative standards. For example, in the early stages a uniform size, round grain sand was assumed to have the highest permeability, and was adopted as a standard. Later investigation proved this assumption incorrect. Likewise, in comparing tests for clay content, it was found that the temperature of the water exerted an important bearing on the final results which are obtained.

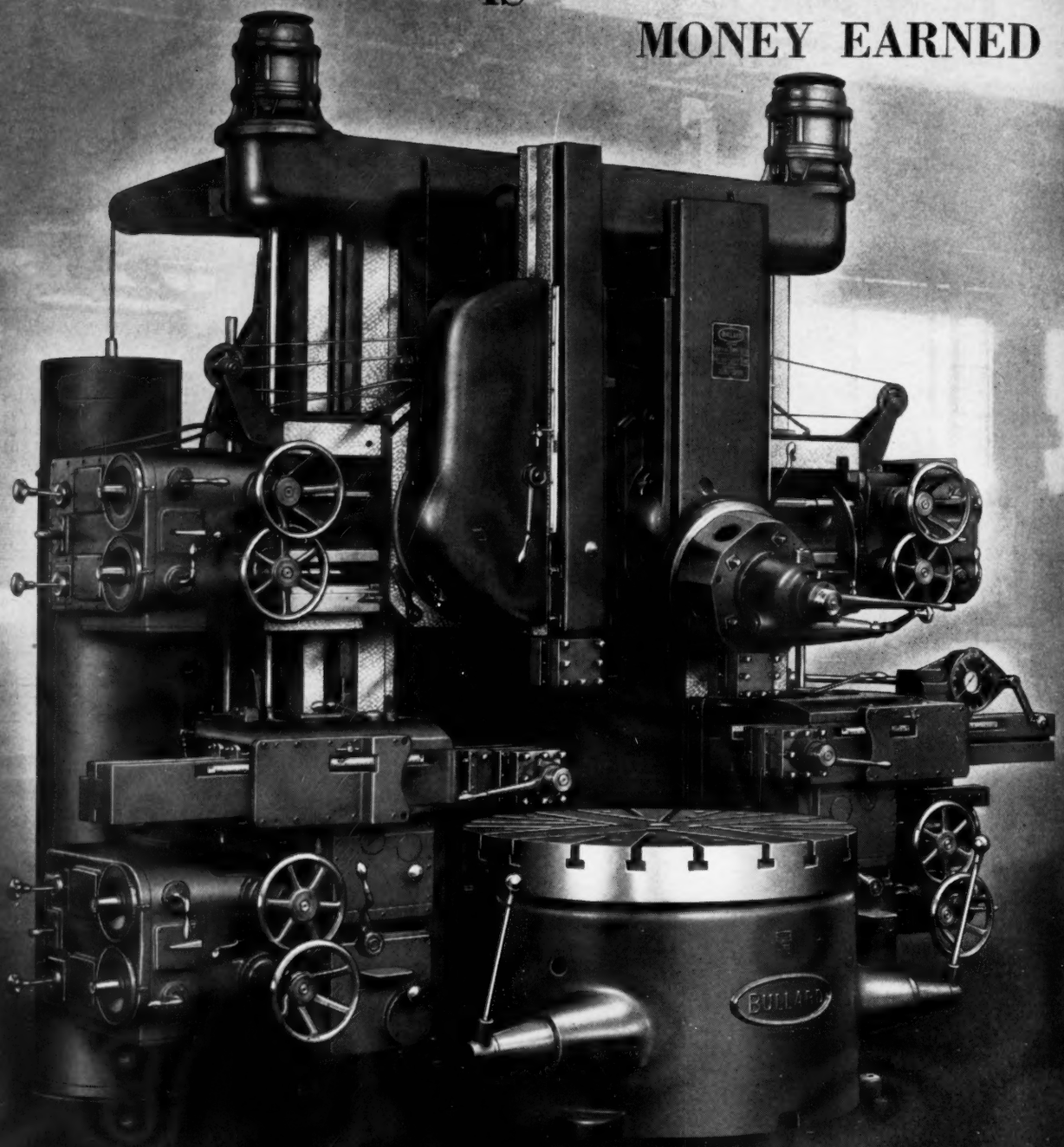
Specifications Not Yet Exact

Other features touched upon included standards for grain size, flowability of sand under compression, characteristics and application of bonding clays, sand specifications. The committee finds it difficult to determine exact specifications. In conclusion, he referred to the wide discrepancy obtaining in the methods of sand testing among foundrymen in various countries in Europe. A revised edition of A.F.A. sand testing methods soon will be issued to supersede the pamphlet published in 1931.

W. G. Reichert, Singer Machine Co., Elizabeth, N. J., explained a proposed method of determining sand characteristics by grain size which insures greater accuracy than the present method.

Mr. Dietert outlined present methods of conducting durability tests and reported progress in the development of a new and shorter method of procedure.

TIME SAVED IS MONEY EARNED



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IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter VI — Part I

Design of Regenerator Chambers

MOST important preliminary steps leading to regenerator design are the establishment of the minimum dimensions necessary to produce satisfactory fluid flow conditions at the regenerator entrances from the fantails, developing critical areas A_{11}, and to the flue system at the regenerator outlets through the connecting flues in which are developed the critical areas A_{12}.

The recommended development of the fantail lines and the approved designs of their brickwork have been offered in Fig. 130 and 131, the former being suitable for producer or preheated mixed gas fuel and the latter for the fixed fuels. The principal modification differentiating the two types is found in the width of the air regenerator chamber of the fixed fuel design the width of which is 1 foot less than that of the producer, mixed gas design.

In a similar manner correct lines of the connecting flues have been developed and were presented in Fig. 144 which included two designs, A, the preferred, and B, a satisfactory alternate if the steel binding design is altered appropriately.

The development of the inlet and outlet connections establishes the heights of these components as the minima necessary to the unabridged design and satisfactory operation of the regenerators of 150 ton furnaces.

Thus, with knowledge of the height between grade and the underside of the charging floor supporting beams or girders, and the subgrade depth to which the masonry may be carried, and in addition the appropriate length of the chamber, the information is then at hand necessary to the development of the regenerator chambers in longitudinal elevation after including the permissible height of the checkerwork. Such an elevation is offered in Sec. D-D, Fig. 145. In this the length taken, 30 feet, in-

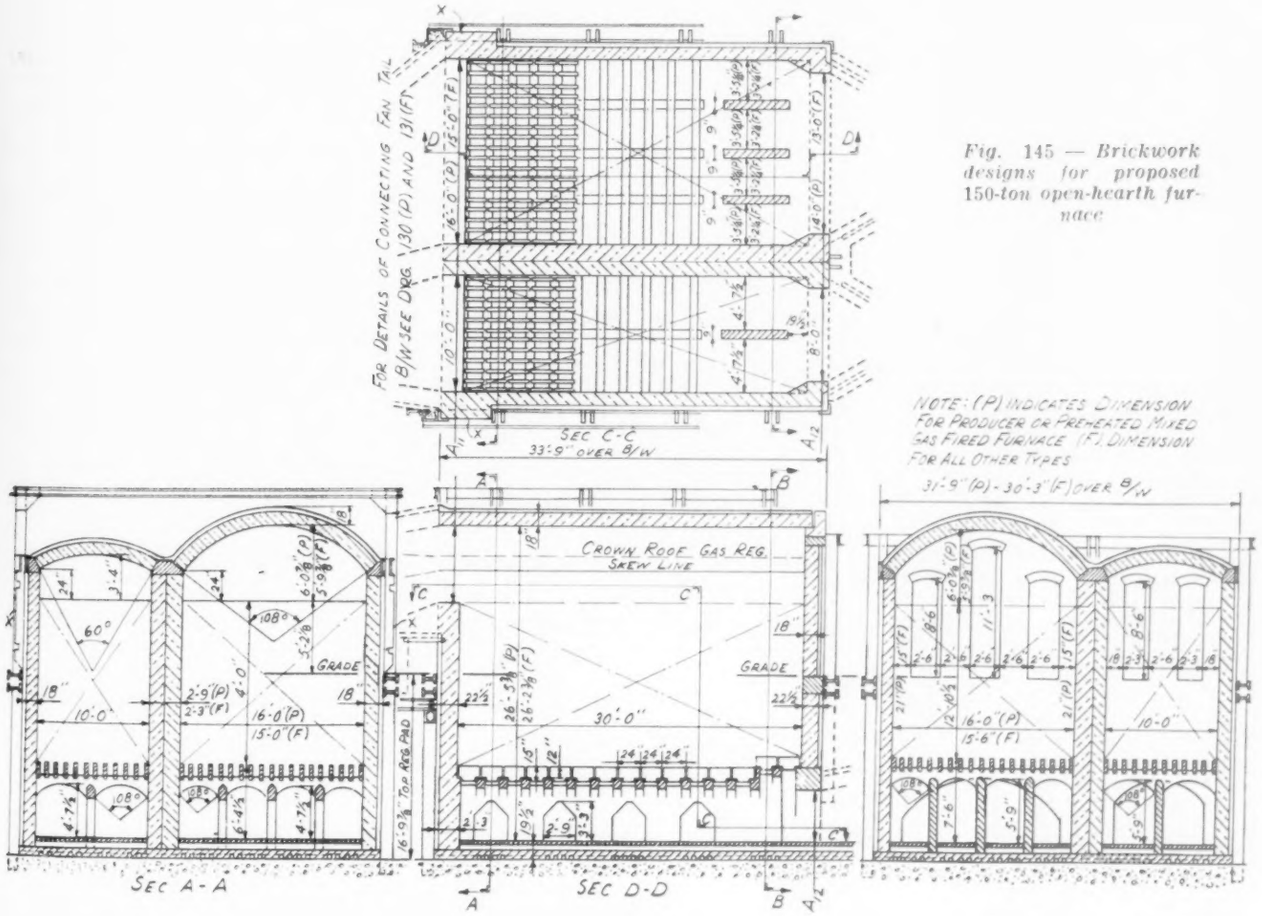

SEC C-C
33'-9" OVER B/W
NOTE: (P) INDICATES DIMENSION FOR PRODUCER OR PREHEATED MIXED GAS FIRED FURNACE (F) DIMENSION FOR ALL OTHER TYPES
31'-9" (P) - 30'-3" (F) OVER B/W
CROWN ROOF GAS REG. SKEW LINE
GRADE
30'-0"
SEC A-A
SEC D-D

Fig. 145 — Brickwork designs for proposed 150-ton open-hearth furnace

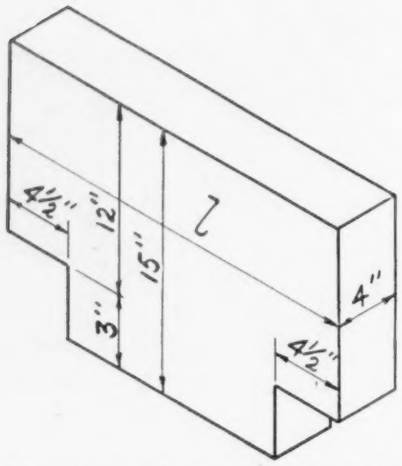


Fig. 146—Detail of T-type rider tile which greatly strengthens entire rider system

side of the brickwork is entirely arbitrary and obviously building limitations may necessitate the shortening of this dimension which is undesirable, or, perhaps, it may be lengthened, which may improve the condition.

The depth of the checkerwork, above the rider tile, 14 feet, while likewise arbitrary is a desirable minimum figure. A greater depth of checkerwork is found in typical furnaces, N, O, I and P, column b, Table CVII. It is about the same as in furnace G, and exceeds that dimension as found in the balance of the furnaces.

However, the design as offered allows a satisfactory height above and below the checkerwork, in addition to the 14-foot depth of checkers, but after including a small but appropriate clearance for the regenerator steelwork under the charging floor beams, excavation must be carried to a subgrade depth of 16 feet 9 7/8 inches at the top of the concrete foundation pad.

Requires Deep Subgrade

This depth is greater than any of the typical furnaces as will be seen from an examination of the dimensions of column e, Table LXXXIX and is only closely approached in the case of furnace L. As will be noted, furnaces L, I, P and G are the only units in which the subgrade exceeds 13 feet, while most of the other furnaces are substantially under this figure.

Taken in consideration with the fact that the elevation of the charging floor is 20½ feet above grade in the proposed furnaces, which approximately is equaled by only four of the typical furnaces, J, K, I and L, it clearly is evident that the considerable heights of the checkers of many typical furnaces Table CVII is secured by abridgement of the heights over and/or under the checkers.

As the development of the volume above and below the checkers is the principal feature that causes the distribution of the fluids to or from the checkers to be good or bad, and as the results secured from the most carefully conceived and constructed checkerwork will be only as efficient as the distribution is effective it will be obvious that if abridgement of height must be practiced, such abridgement should take place entirely in the checker dimensions and not in the upper or lower chambers.

The foregoing idea will be in disagreement with the thoughts of operators who have crowded the regenerator chambers with checkerwork, encroaching on the distributive volume in the hopes of developing fuel economy, but actually causing much of the checker volume to be ineffective in its purpose, and the increased checker volume to produce negative economic effects. Later the idea that a smaller checker volume with better fluid distribution will develop superior operation will be advanced.

The simple box-type checker design outlined in Fig. 145 is indicative of the most elementary design, but in a subsequent chapter various designs of checkerwork adapted to the checker chambers shown will be developed.

The volumes available for checkerwork in the various proposed arrangements to include that occupied by the rider tile above the rider arches and calculated on the same basis as those of the typical furnaces listed in Table CVII are: Gas chambers 10 x 15 x 30 feet or 4500 cubic feet; air chamber, producer gas firing, 16 x 15 x 30 feet or 7200 cubic feet; and, air chamber fixed fuel firing, 15 x 15 x 30 feet, or 6750 cubic feet. The gas checkers as proposed are exceeded in volume by those of furnaces N, O, and L, the producer fired air chamber only by that of furnace I, and as combined in fixed fuel practice to 11,250 cubic feet the available checker volume is exceeded only by that of furnace F.

However, as before stated, such a comparison is without value and in order to compare the design equitably with those as found in the typical furnaces the factor of the ratio of checker volume to that of 1 cubic foot of fuel or air passing per second and as determined for the typical furnaces and listed in Table CIX is set up in Table CXIX. This will show the proposed furnaces to be substantially of more liberal design than any of the typical furnaces excepting furnace F. It will be recalled from the prior text that furnace F, originally designed to tap 250 tons, later was altered to tap less than 150 tons and the flow values were calculated from this lower value.

Strengthens Rider System

The construction details of the rider system, Fig. 145, are found the same as when rider arches are employed. The cross connections through the rider walls are a great aid to distribution and should be used liberally. The "T" type of rider tile shown is detailed in Fig. 146. The inclusion of this advanced design greatly strengthens the entire rider system and in the quantities used in open-hearth construction the cost will be little, if any, higher than for plain tile. The length, l, will be the same as the spacing of the rider arches less ¼-inch. The 24-inch spacing shown, Fig. 145, is convenient but may be increased to 27 or even 30 inches to better fit a particular layout.

Two narrow bulkheads in the gas regenerator and three in the air chamber are much better arrangements than a lesser number of wider bulkheads in that they are much easier to keep sealed effectively and the passage of material in or out of a chamber during construction or a rebuild is greatly expedited.

The extension of the thickness of the regenerator walls at the front of the chamber, marked "X", Fig. 145, is to allow the secure binding of the steel work without narrowing the width of the inlets at A_u. It is incorporated only in the upper half of the chamber. The normal wall thickness is 18 inches, 13½ inches of fire brick and 4½ inches of class

Table CXIX

Comparative Checker Volume Per Unit of Air or Gas Flow

(Proposed Furnaces)

	Air			Gas			
Proposed furnace	Volume checker work, ft.³ a	Air, ft.³/sec. b	Factor a/b c	Volume checker work, ft.³ d	Gas, ft.³/sec. e	Factor d/2e f	Combined factor c+f g
Producer or mixed gas	7200	210	34.3	4500	190	11.8*	46.1*
Fixed fuels	11250	238	47.3	.....	.....	.....	47.3

*If firing mixed gas the factor, column f, would be approximately 23.6 and the combined factor, column g, 57.9.

Every Hour on the Hour

■ Typical! Adjacent to Chicago's loop with its scores of skyscrapers—Crane's service knows no 8-hour day. At night, every hour on the hour, a watchman arrives at the entrance to admit loop maintenance men seeking parts, valves, and fittings for their respective buildings.

Maintenance men can tell you better than we can the advantages of a completely Crane-equipped plant, with instant interchangeability of many parts, constant, ever-ready supply, absolute uniformity, and the money-saving, worry-saving feature of one responsibility for every part of the plant piping.

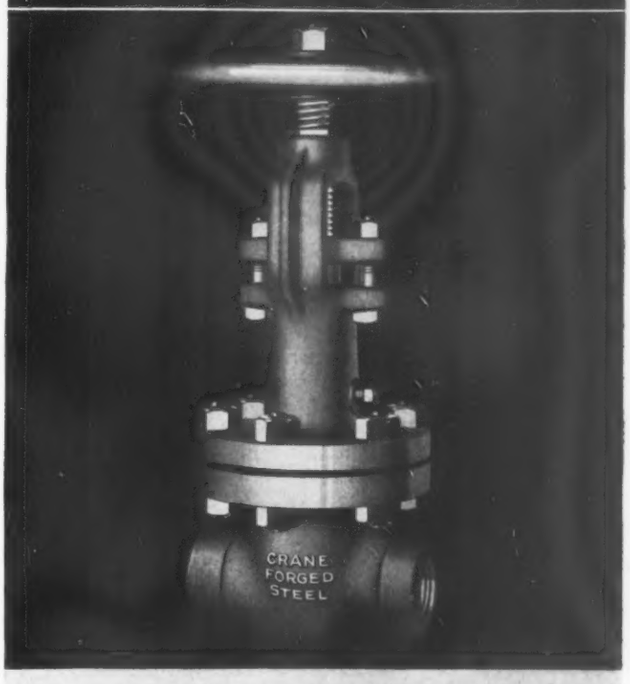
With Crane valves, fittings and fabricated piping you have uniform reliability. And this grows more important each day as production increases, and there is a vital need to "keep going" in response to demand.

CRANE SHOP FABRICATION SERVICE

Design	Flanging
Casting	Cutting
Bending	Threading
Welding	Assembling

There is a Crane Valve or fitting for every piping requirement

SUPERHEAT



Crane 176-P Forged Steel Plug Disc Globe Valve

1 A rugged valve built to control high pressures—steam at 900 pounds with extreme superheat.

2 The scientifically designed plug type disc will withstand the ravages of throttling service.

3 Width and angle of seat bearing give long service life but do not restrict flow or permit disc to wedge in seat.

4 Full area passageways are provided in the valve body.

5 The bolted bonnet, with its alloy steel full threaded stud bolts, stays tight after repeated disassembly.

6 Seats and discs are regrindable.

CRANE VALVES, FITTINGS and PIPE FABRICATION

CRANE CO., GENERAL OFFICES: 836 SO. MICHIGAN AVE., CHICAGO, ILL. • NEW YORK: 23 W. 44TH STREET

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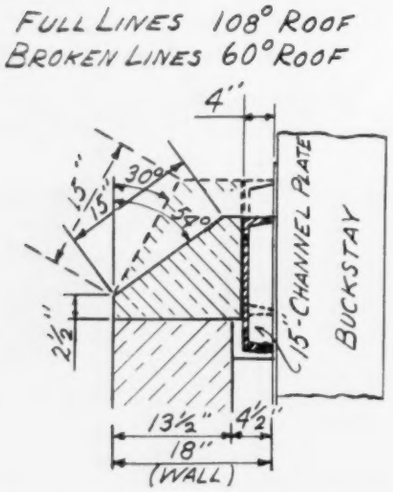


Fig. 147—Regenerator skew arrangement. Full lines, 108-degree roof; broken lines, 60-degree roof

B insulation. At "X" the wall is thickened to 27 inches which may be all of fire brick or include 4½ inches of class A insulating brick which must be selected for its property of considerable crushing strength. An alternate method of binding the regenerator chamber so as not to decrease the entrance area is to extend the sidewalls towards the slag pockets to such a distance as to amply clear the sidewalls of the fantails. Such an arrangement of correct design is seen in Fig. 127, furnace P, and of incorrect design in Fig. 129, furnaces D and M. Any other arrangement of binding causes encroachment of regenerator entrance width and should not be used.

Refractories in Proposed Regenerator Chambers

First-quality (best) fire brick should be used throughout as the inner veneer of the structure excepting possibly the paving at the bottom which may be second quality firebrick. Best fire brick also should be used throughout the rider system.

The thickness of the refractories shown in the design of the proposed regenerator chambers conform to those developed as the most economic in Chapter IV. Thus the recommended roof construction is 15 inches of firebrick and a sufficient depth of class D insulation to develop a combined thermal resistance, R, of 4.0.

All sidewall thickness is 13½ inches firebrick and 4½ inches class B insulation, except at "X" as before mentioned.

The center walls are 2 feet 9 inches thick for preheated fuel practice and 2 feet 3 inches for all other operation.

The front and backwalls are 18 inches of firebrick and 4½ inches of class B insulation, and the bulkheads 13½ inches of firebrick and 4½ inches class D insulation. The front and backwalls are thickened inward 4½ inches, as shown, at the correct elevation in order to support the outer ends of the first and last rows of rider tile.

The bottom consists of a 10-inch hollow foundation on top of the concrete pad extending under all masonry construction. The bottom paving within the confines of the regenerator walls is 4½ inches of firebrick and 5 inches class E insulation on top of the hollow foundation.

Skew systems of the regenerators should be of the proper design and ample strength if long roof life is sought. This is highly important. The regenerator chambers have the conventional roof skew system and in addition when the recommended rider arch system is included there will be a secondary system to distribute and support the loadings transmitted by the rider arches from the checkerwork they support.

The roof skew arrangement is detailed in Fig. 147 and as shown consists of a skewback brick and a skewback channel.

Brick Should Be Hard Burned

The skewback bricks are manufactured to the dimensions as indicated for both the 60 and 108-degree roof. A thickness of about 3 inches is convenient. The material is best firebrick and should be hard burned.

Before selecting a channel section it will be necessary to determine the horizontal thrust (HF) that will be developed by the roofs and the rider arches.

This is accomplished easily by first finding the value of ⅞ W for the 10-foot span 60-degree roof from Fig. 103 which (by extrapolation) at 15-inch thickness is found as 900 pounds per foot of length, and of the 16-foot span 108-degree roof at 15 inches thickness as 1640 pounds per foot of length from Fig. 118.

If the horizontal thrust developed by these two roof designs is solved in accordance with equation No. 7 (STEEL, Jan. 9, 1933) the values of HF for the 60-degree roof will be 1687 pounds and for the 108-degree roof 1640 pounds. Thus, the opposing forces of the two different arches are nearly the same which as before mentioned is a necessity. The greater of the values, 1687 pounds per foot of length, will form a basis of the subsequent buckstay design.

The widest rider wall spacing is found in the gas chambers, 4 feet 7½ inches. The 108-degree arch is convenient here and if incorporated the same skewback brick as designed for the roof may be used. If the depth of the checker brick is taken as 15 feet, the percentage of checker brick in a unit volume as 40, and the weight of firebrick as 130 pounds per cubic foot, the weight reacting on one-half the arch, or ½W, will be $15 \times 4.625 \times 130 \times 0.40 \div 2$ or 1820 pounds per foot of length. Solved by equation (7), HF = 1860 pounds per foot.

The values of the horizontal thrust with the three different arrangements, 1687, 1640 and 1860 pounds per foot of length are sufficiently close to reasonably allow a channel section designed for the heavier loading to be used economically for all three.

In the designs to be presented the buckstays will consist of two slabs about 8 inches apart and spaced at 8 foot centers.

Equation Is Employed

Accordingly, the maximum bending moment in the skewback channel may be found from solving by equation No. 21 (STEEL, Feb. 13, 1933) in which W = 14,880 pounds, l = 84 inches, and a = 6 inches, the result being 134,120 inch-pounds.

At 9000 pounds allowable fiber stress for rolled steel and 7000 pounds for cast steel it may be found the appropriate section modulus will be 14.9 if a rolled section is used or 19.1 if a cast steel section is selected. As the heaviest 18-inch channel section has a section modulus of only 5.3 on the axis stressed it is obvious that rolled channels should not be used without considerable reinforcement. As it is neither convenient nor desirable to include sufficient reinforcement a cast steel channel designed to develop the required strength should be used. A section of the profile shown, Fig. 148, will be suitable if made from cast steel conforming to the ASTM specification of "grade B hard." The section shown has a modulus of 19.4, and weighs 96 pounds per foot.

Arranging the skew channel with the toes outward to the buckstays as shown, Fig. 147, simplifies the brickwork somewhat, and as the channels are to be supported only on the brick wall and allowed to "float"

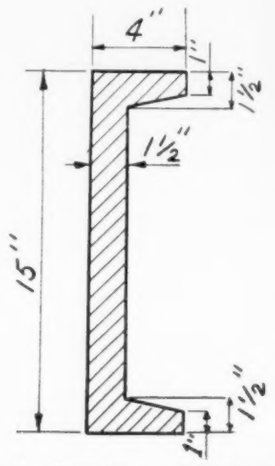
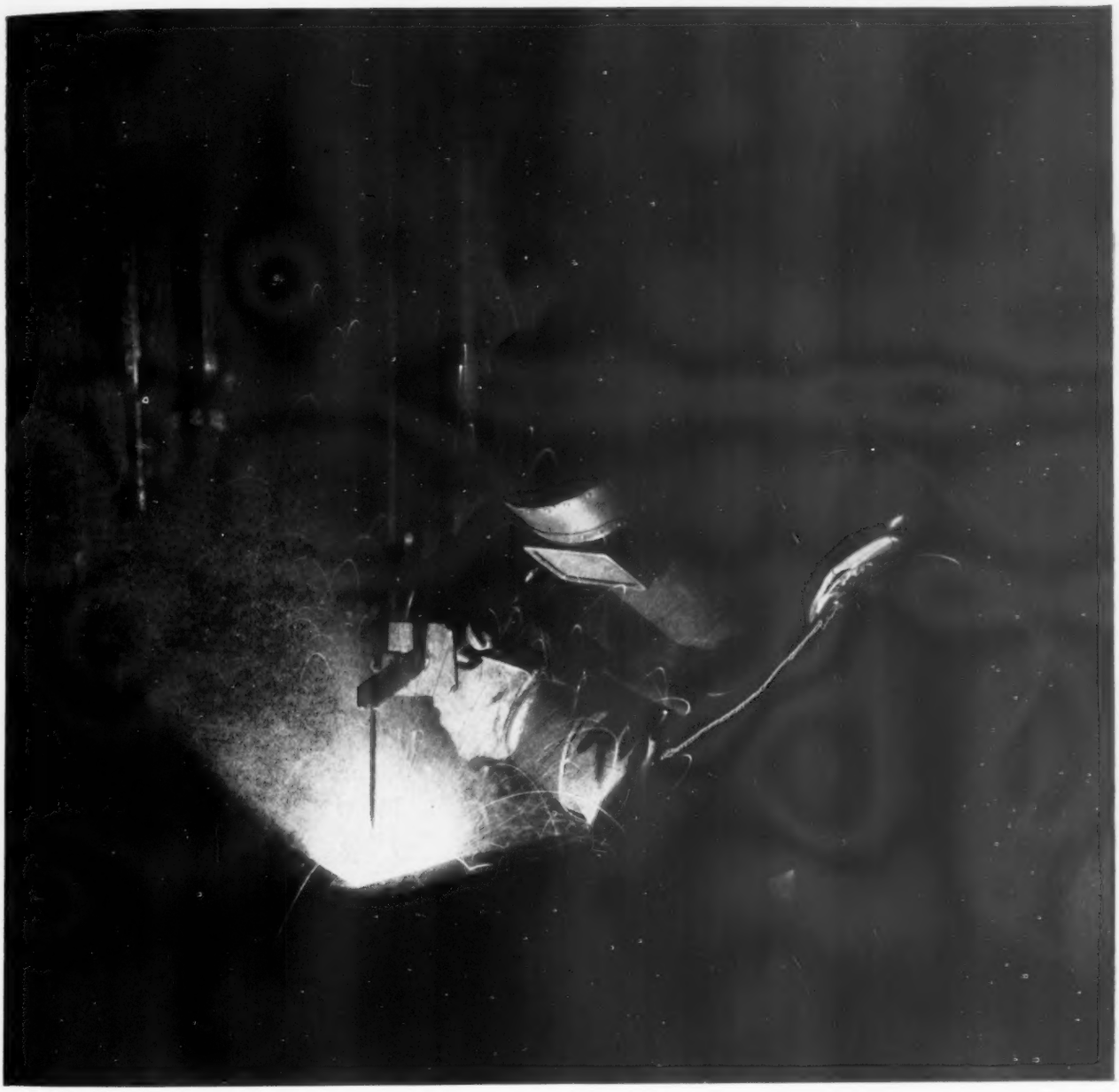


Fig. 148—Skewback channel section for roofs and rider arches of proposed furnaces

Roebling — the custom-made wire for exacting welders



THIS fine welding wire is widely used by industrial plants, railroads, oil refineries, structural steel contractors, and others who require welding wire which meets exceptionally high uniformity requirements. Made by Roebling's special *custom* methods, it is absolutely uniform in quality and is free of non-metallic impurities. ¶ Available for either electric or gas welding, in a variety of straight lengths or in coils. Write for full information, prices or samples.

JOHN A. ROEBLING'S SONS CO., TRENTON, N.J.

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with the wall as it expands or contracts, the conditions surrounding any movement of channels while in contact with the binding steel are benefited.

The ordinary regenerator chamber binding usually consists of a series of vertical buckstays at the sides with cast steel angles at the corners which also serve as anchors for rods by which the buckstays are trussed in an effort to maintain alignment and to strengthen the binding. Rods always are used to tie the buckstay tops. The bottoms of the buckstays may be tied with rods passing through the hollow foundation or grouted into pockets in the concrete foundation. The latter method is favored in the majority of the typical installations.

From the variety of size and sections used for buckstays, and the considerable variations of the buckstay spacings found in the regenerators examined, it would appear that the design of the regenerator steel hitherto has proceeded along empirical rather than analytical lines.

The following sections are found as buckstays in the typical furnaces: 10-inch slabs, furnace P; 10-inch I-beams, furnaces D and M; 12-inch channels, furnace E; 12-inch I-beams, furnaces A, N, O, I, G and B; 15-inch I-beams, furnace F. All of these furnaces use the scheduled sections in pairs, but 15-inch single I-beams are used as buckstays, furnace H.

The approximate maximum spacing center to center of buckstays is found as follows: 5½ feet, furnace G; 6½ feet, furnace H; 9 feet, furnaces B, D, F, and M; 11 feet, furnace E; and 12 feet, furnaces A, N and O.

(To be continued)

Metals Are Brazed in Controlled Atmosphere Electric Furnaces

(Concluded from Page 38)

heat treatment, regardless of whether the steel has been subjected to a short-time copper brazing treatment.

Parts can be carburized either before or after the brazing operation. If carburized before brazing, they are usually copper plated and special precautions are taken in the preparation of the brazing furnace atmosphere to further prevent decarburization. A fairly heavy case is desirable to compensate for some loss of carbon by diffusion into the core.

When electric furnace brazing assemblies made of copper, deoxidized copper should be used for the body metal. Otherwise, embrittlement of the copper will result from reaction of the reducing gases in the furnace atmosphere with the oxides in the copper.

Produces Annealing Effect

Parts which have been work hardened in processing will, of course, lose much of their stiffness in the electric furnace brazing process, because of the annealing effect of the treatment. In general, however, this annealing effect is favored.

Most of the modern brazing furnaces are built for continuous or semicontinuous operation, with the flow of material passing from the heating chamber immediately into an adjoining cooling chamber where the work is allowed to cool without oxidation.

Several manufacturers have started out on a relatively small scale with a box-type brazing furnace such as the one shown at the left in Fig. 11. This furnace is suitable for production work as well as for developmental purposes. The heating chamber holds on its hearth plate a tray 11 inches wide by 22 inches long, and the cooling chamber holds two trays. The rating is 24 kilowatts.

Each end of the furnace is equipped with a self-sealing door which is fairly gas-tight, and there is a refractory door between the heating chamber and the cooling chamber serving as a radiation screen. In addition to the usual brazing service, these furnaces generally are employed a few hours each week for scale-free hardening and bright annealing.

Resistors Are Light Weight

The furnace illustrated is designed for 2100 degrees Fahr. operation. The resistors in this furnace, and in the others which will be shown, are made of thick nickel-chromium ribbon, which, although being sturdy, is sufficiently light in weight to support itself on hooks without sagging.

The mesh-belt, conveyor-type furnace is well adapted for copper brazing light-weight parts. Good operating economy, rapid heating of the work, and low handling charges, are all points in its favor. The continuous furnace shown at the right in Fig. 11 has a belt 8 inches wide, heating chamber 4½ feet long, and cooling chamber 14 feet long. Its rating is 28 kilowatts. The brazing furnaces in Fig. 11 are the ones used in the plant of the National Cash Register Co., Dayton, O.

For copper brazing steel-fin condensers in relatively large-scale production, the two mesh-belt furnaces illustrated in Fig. 8 are used. One furnace has a belt 12 inches wide and the other 20 inches wide. Heating-chamber lengths are 5 feet and 8 feet, respectively. In the refrigerator department of the General Electric Co., Schenectady, N. Y., there are two furnaces identical with the 20-inch, 88-kilowatt furnace shown.

Other types of brazing furnaces are also in service, such as the roller-hearth type, pusher-type, bell-type, pit-type, etc., but those illustrated will serve to show in general the kinds of equipment which are employed in the process.

Gases Used For Atmospheres

Although hydrogen makes an excellent atmosphere for brazing furnaces, as does also dissociated ammonia, which is 75 per cent hydrogen and 25 per cent nitrogen, the most commonly used gas for furnace atmospheres is an inexpensive mixture formed by the partial combustion of natural gas, coke-oven gas, butane or propane. This mixture contains about 20 per cent hydrogen, 12 per cent carbon monoxide (both of which give a reducing effect at 2100 degrees Fahr.), 3 per cent carbon dioxide, and 65 per cent nitrogen. This gas costs only 10 to 50 cents per thousand cubic feet, and produces very satisfactory results.

The machine illustrated in Fig. 12 in which the gas is processed, is called a combustion-type, furnace-atmosphere controller. The ingoing gas and air pass through visual flowmeters where the ratio and volume can be observed at a glance. The gas and air then enter a motor-operated mixer which positively controls the input ratio and holds it constant regardless of the load. The gas-air mixture is then burned in a combustion chamber, from which the products of combustion pass through a surface cooler. Here some of the moisture is condensed out before the gas goes to the furnace. In the heating and cooling chambers of the furnace the gas forms a protective atmosphere which prevents oxidation of the work, and encourages the brazing metals to wet and flow on the parts.

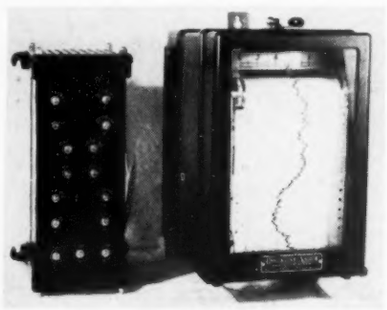
In conclusion, it can be said that the use of controlled atmospheres in the joining of metals has found a definite place in the art of metal fabrication. Its worth is indicated in a good acceptance by industry during the past few years, and by 29 years of service in one of the largest plants in the country. Now that the process has become available to all, its possibilities for improving quality, speeding up production and saving money are gaining general recognition, and a much more widespread use undoubtedly will be seen in the future.

NEW EQUIPMENT

Graphic Recording KVA Meter—

Esterline-Angus Co., P. O. Box 596, Indianapolis, announces a new graphic recording KVA meter which consists of one of its standard model AW graphic watt meters and a special phase shifting transformer. By means of three sets of taps the instrument is made to cover a range of power factor from 0.54 to 0.94 with an error not exceeding 1½ per cent. A tap is provided on the phasing network to permit measurement of reactive volt-amperes with the same instrument. By omitting the network, the instrument can be used as a graphic wattmeter. The instrument is furnished as a complete unit, or the network can be furnished separately for use with existing meters.

This instrument has unusual flexibility in application, and makes possible KVA measurements with higher



Graphic recording KVA meter developed by Esterline-Angus Co.

accuracy than could be obtained on previous equipment. Instruments of this type are particularly valuable in studying KVA consumption in mills regardless of whether or not billing is done on a KVA basis.

• • •

Mobile Crane—

Bucyrus-Erie Co., South Milwaukee, Wis., announces that in addition to having the same mobility which features the smaller Loadmaster, the new CT-50 machine, shown herewith, provides greatly increased capacity and use of a longer boom. This feature plus fast crane operating speed and ease of operation qualifies it for handling heavier industrial jobs such as track laying, steel erection, pipeline work, in fact any work in-

Bucyrus-Erie CT-50 crane handles loads up to seven tons

volving lifting and carrying loads weighing up to seven tons. The boom swings through an arc of 240 degrees.

Low ground bearing pressure insures safe travel over soft spots. Equalized crawler mounting automatically adjust itself so that both traction belts follow surface irregularities and maintain maximum contact with the ground. With the setting of hydraulic stabilizers when ready to lift a load, the machine becomes a rigid unit having stable footing. Control levers are located conveniently and easily operated.

• • •

Tilting Rotary Table—

Pratt & Whitney Co., Hartford, Conn., is introducing a new 10-inch tilting rotary table designed for use with the company's No. 1A jig borer. This table is for precision boring holes at exact angles as well as for boring work of a circular nature which is most easily laid out using polar coordinance. The scraped surface is 10 inches in diameter, and contains standard work holding T-slots and an accurate hole in the center for locating work. The outer edge of the table is graduated in degrees for approximate indexing using a large rapid traverse handwheel. For exact setting a slow motion handwheel is engaged by a clutch knob. The large graduated dial and its vernier make possible accurate indexing to two seconds. A non-influencing binder keeps the rotary movement locked solidly during boring.

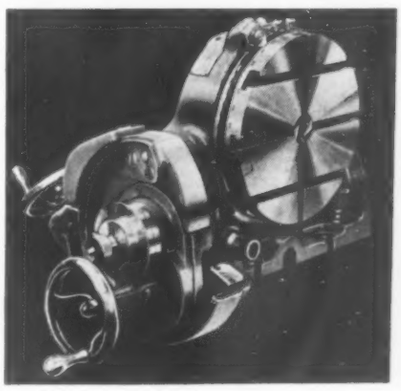
The entire table, shown herewith, is hinged at one side and can be tilted to any angle from zero to 90 degrees. Graduations and a vernier provide for accurate setting to one minute. The tilting movement locks solidly during boring. Table height in a horizontal position is 6⅛ inches, and its net weight is approximately 200 pounds. It is furnished with a proving bar, a chart, a gage for angular setting and with either hold down straps or T-bolts.

• • •

Numbering Machine—

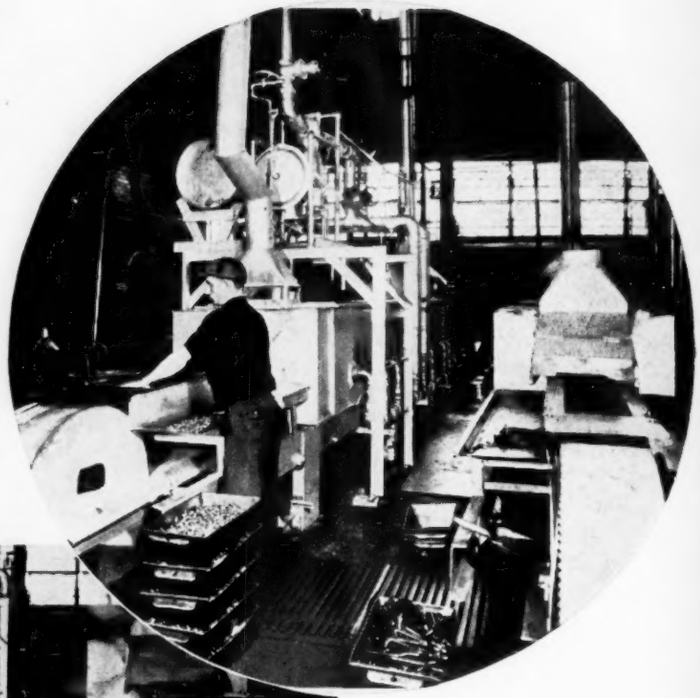
Numberall Stamp & Tool Co. Inc., Huguenot park, Staten Island, N. Y., is announcing a hand-operated numbering machine by which brass tool checks, machine number plates and similar objects can be stamped with letters or figures. Platform of the machine, shown on page 53, is 4 by 4 inches in size and is equipped with flanges so that it can be bolted in place on a bench if necessary. The "stamp" slides vertically in a substantial bearing, and carries either 3, 4, 5 or 6 wheels, bearing either figures or letters, as desired. The stamp is held in position by a spring, and when in use, the stamp is pressed down by hand until it rests on the plate or check and then is struck a light blow with a hammer, making the desired impression in the material. The stamp holding arm works on a hinge and can be lifted to facilitate changing the numbers.

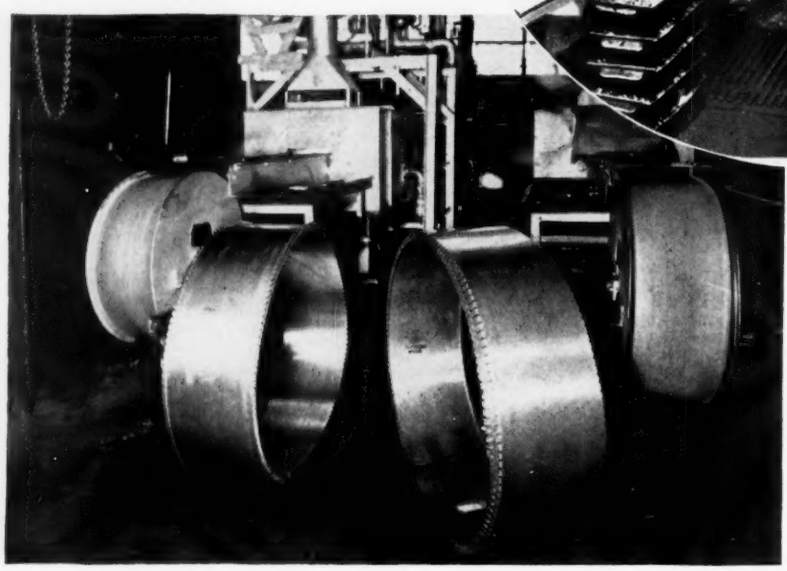
Numberall stamps are engraved by the pantograph engraving method, producing sharp and clear characters. The platform is equipped with a graduated adjustable guide and set-screw to enable the operator to locate the



Pratt & Whitney tilting rotary table in vertical position

Torrid TEMPERATURES YET "ARMCO STAINLESS" GIVES *Plus Hours.*





ABOVE • *Back and forth they go through the continuous drawing and hardening furnaces, these conveyor belts of Armco 17 Stainless Steel. Hours of heat-resisting service, no oxide pick-up, dollars-and-cents savings — these are the unprecedented advantages.*

LEFT • *The 51 and 53 foot Armco Stainless Steel coils are notched and bent up at a 90° angle to form a holding flange.*

In and out of a continuous annealing furnace conveying 1000 pounds of SAE 1035 steel bolts an hour—that's a tough job for any belt metal . . . especially when the temperatures range between 600° and 1600° Fahrenheit.

But Armco Stainless Steel belts take the ordeal in stride—give plus hours in this extremely severe service. The manufacturer is elated, as well he might be. It means money saved, money earned.

Armco 17 Stainless stubbornly resists scaling. Result: no iron oxide pick-up with its frequent renewal of pickling solution. Clean belts mean clean bolts.

Whether the conveyor belts you make or use must withstand elevated temperatures or keep food materials clean, Armco Stainless Steel Cold Rolled Strip is the ideal metal. We'll supply it in coils in any length you need.

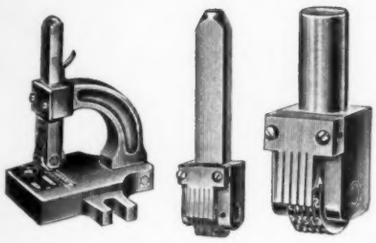
Put your stainless steel requirements up to Armco. Just a word to the address below will bring ready cooperation.

• • •

The American Rolling Mill Company, Executive Offices, Middletown, Ohio. District Offices in all Key Cities.

ARMCO **STAINLESS STEELS**

Finely Finished • Heat Resistant • Corrosion Resistant



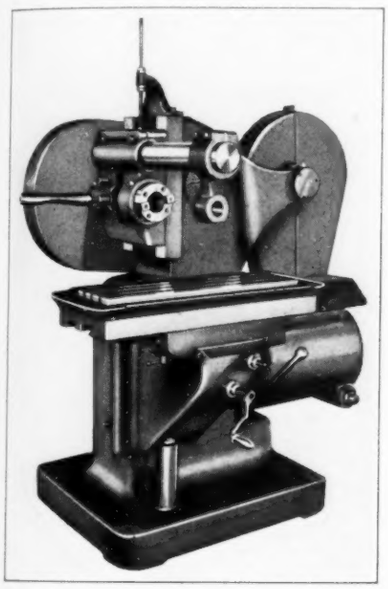
Numberall machines for stamping letters, numbers, etc.

plates or tags with speed and precision. The stamp can be removed from the holder, when required for use as a hand stamp for stamping machines and other large objects. Figures or letters can be supplied from 1/16-inch to ¼-inch in size.

♦ ♦ ♦

Milling Machine—

Kent-Owens Machine Co., Toledo, O., recently announced its new No. 26 milling machine, the table feed of which is cam controlled to permit



Kent-Owens milling machine incorporates several new features

any desired cycle of automatic table movement. It is applicable especially to high production jobs or long runs requiring maximum machine economy.

A cushioned belt drive to the spindle assures smooth cutting with an absence of backlash. Standard equipment permits spindle speeds to 2000 revolutions per minute, although speeds higher than that can be provided. The usefulness of this milling machine, shown herewith, is broadened by its adaptability for special automatic fixtures and special cutter arrangements. A table working surface of 36 x 8¼ inches with 3 tee slots permits the mounting of two fixtures, one of which can be unloaded and loaded while the other is under the cutter.

Pick-off gears in the table feed train readily permit changing cam drum speed. Cam drive gears, cam and clutch operate in an oil bath. The cam housing is cast integral with the saddle and mounted on the knee. A multiple plate clutch assures smooth engagement and instantaneous release. The cam may be disengaged by the operator at will.

This machine may be turned by hand throughout its complete cycle in order to facilitate setting up and making adjustments.

♦ ♦ ♦

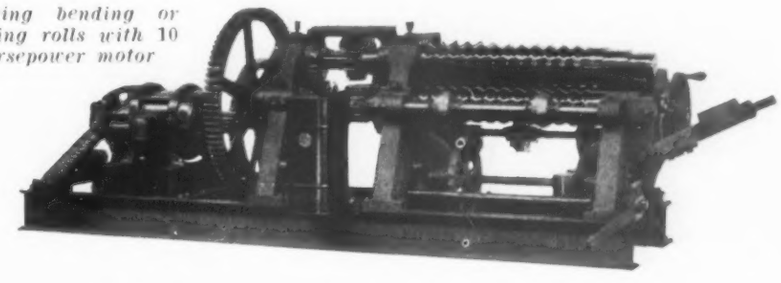
Bending or Curving Rolls—

Geo. Whiting Co., 1719 Elston avenue, Chicago, is announcing new bending or curving rolls. One model of the machine is equipped with corrugated rolls for curving corrugated culverts, and is fitted with double friction clutch pulleys for running the rolls in both directions. The unit also can be equipped with plain rolls for forming cylinders of plate or sheet steel.

Known as the Initial type, this unit is designed with the top roll over the bottom roll and the bottom roll adjustable diagonally. The machine has the end or hinged housing balanced so that it can be handled with little effort on the part of the operator, thus eliminating the laborious work of lowering or raising the housing by hand. Top roll is balanced and by means of a lever in front of the hinged housing it can be thrown out of position for removing the culvert when formed. The end housing can be lowered by an easy movement of one hand by merely sliding to one side the holding catch. It locks itself automatically when thrown back into position again. With this machine it is not necessary to take the back gears out of mesh or stop the machine before removing the corrugated culvert after it is rolled.

The machine can also be fitted with motor and reversible controller when desired, as shown in the accompanying illustration. While this picture represents the Initial type of bending or culvert curving rolls, the balanced feature on the end or hinged housing can be used on the pyramid type of bending rolls employed to form plain steel pipe, tanks, or large cylinders, etc. This balanced housing is a distinct improvement over other types of rolls in this class in that it enables the operator to handle the housing much easier and quicker and with considerably less effort.

Whiting bending or curving rolls with 10 horsepower motor



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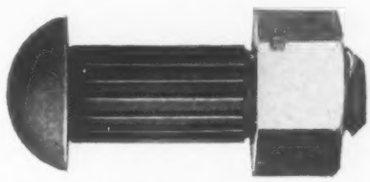
Structural Rib Bolt Used With Automatic Nut—

Automatic Nut Co., Chrysler building, New York, announces a structural rib bolt for use in the erection of buildings, bridges, tanks, towers, cars, etc., in conjunction with the automatic nut. Shown herewith, it has the standard American Boiler Makers association button head. The ribs embed themselves into the wall of the work, making a tight fit. Made from carbon manganese steel, the bolt is claimed to have a minimum tensile strength of 70,000 pounds per square inch.



Structural rib bolt developed by Automatic Nut Co. Inc.

The bolt has a standard U. S. S. thread, and is made in either black or galvanized. The only equipment necessary for its erection is hand hammer and wrench, effecting a saving, especially when used in the field. It is made in all sizes and lengths.

♦ ♦ ♦

Interchangeable Breaker and Sheeting Driver—

Worthington Pump & Machinery Corp., Worthington avenue, Harrison, N. J., is calling attention to a powerful easy running breaker for heavy demolition and kindred work, that is convertible also into a useful sheet piling driver. This double-duty tool, shown on page 54, is useful for the heaviest classes of concrete breaking, general demolition work, crushed rock tamping, ripping up pavements, loosening hard pan, removing slag in blast furnace work, and in its converted form for driving sheet piling.

Easily manipulated by the work-

Worthington interchangeable breaker and sheeting driver

man, the blows struck by this tool are hard, slow, and effective. Conversion to a sheeting driver tool is simple and quickly performed. Also, the sheeting driver head can be swung around to its best working position by removing the head bolts.

If desired, either the breaker or the sheeting driver may be purchased as a separate unit. Net weight of the breaker is 82 pounds; length over all without tools, 29 inches. Net weight of the sheeting driver is 120¼ pounds; length over all 28¾ inches. Steps of the sheeting driver are adjustable and removable. The standard head is for 2-inch sheeting but, when specified, heads are furnished for 2½ and 3-inch sheeting. Cheek plates make it possible to drive any of the three sizes. Air consumption, through a ¾-inch hose, is low.

• • •

Exhaust Line Purifier—

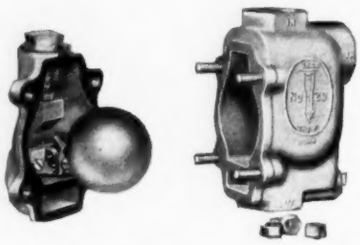
Centrifix Corp., 3029 Prospect avenue, Cleveland, recently developed an exhaust line purifier that is particularly adapted for installation in exhaust steam lines for the removal of water, oil and other impurities, where only low pressures not exceeding 30 pounds are encountered. There are two distinct separating stages; the first recovers the bulk of the entrainment and the seconds acts as a refining stage. Therefore, the same degree of performance is assured with low or a high percentage of entrainment.

The unit, shown herewith, removes virtually all the oil from exhaust steam, leaving it suitable for use in an open heater. Casing of the device is fabricated by electric arc welding with flanges faced and drilled to 125-pound American standard. Tuyere blades are stainless steel or monel cast in iron ring and central vortex cone. The two drains, one for each stage, are connected to a common trap with an equalizing leg to balance any pressure difference.

• • •

Combination Float and Thermostatic Type Steam Trap—

American District Steam Co., North Tonawanda, N. Y., is placing on the market a new steam trap which is a combination float and thermostatic type. The entire working mechanism is mounted on the cover, with all piping connections on the body. Cover and working mechanism may be removed for inspection and cleaned without disturbing the piping connections.



Steam trap developed by American District Steam Co.

This device, shown herewith, is a continuous flow type, with a deep water seal to prevent loss of steam. A limit stop on the float lever prevents the elevation of the float beyond normal—a sudden rush of condensate cannot damage the float by contact with the body. The trap is furnished in six capacities at given pressures. Two of the models are arranged for either vertical or 90 degree inlet connections, while the third is provided for horizontal inlet and outlet connections from either side.

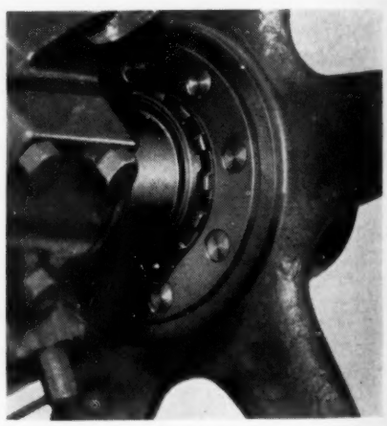
The smallest trap, weighing a little more than five pounds, is adapted for installation with concealed and indirect radiation. It fits well within the small recess alloted to invisible radiation, and its vertical inlet and outlet connections on the same centerline allow it to be revolved to any convenient position where the cover can be removed for inspection.

• • •

Sleeve Type Clutch—

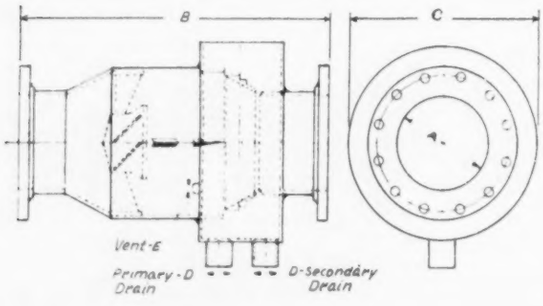
Niagara Machine & Tool Works, 627-697 Northland avenue, Buffalo, is marketing a new fourteen point engagement sleeve type clutch, shown herewith. A hardened alloy steel clutch sleeve has fourteen jaws which engage with those of the wheel facing. The clutch sleeve slides laterally on the crankshaft, when engaging or disengaging with the wheel facing. When the sleeve is engaged, driving energy is transmitted to the crankshaft by twenty-six internal splines generated on the inside of the clutch sleeve bore. These are in constant mesh with the corresponding external splines on the crankshaft. There are no separate keys.

The crankshaft may be arranged to stop at, before, or after the top-center position, by mounting the clutch sleeve in the corresponding radial position. The twenty-six splines provide twenty-six possible positions. When the treadle is depressed, a large concentric spring slides the clutch sleeve into engagement. At the end of the stroke, the sleeve is positively withdrawn by a cam race machined in the sleeve, which is engaged by hardened alloy steel follower spindle, mounted in long antifriction bearings.



Niagara fourteen point engagement sleeve type clutch

A positive locking device is built in the throwout to prevent accidental engagement of the clutch when setting dies. The clutch may be locked or released while the flywheel is rotating by simply turning a small handle in the front of the throwout. A single stroke, non-repeat device is



CENTRIFIX two-stage exhaust steam line purifier designed for high efficiency in removing water, oil, etc.

You must have GOOD WIRE To make GOOD SPRINGS

WIRE FOR

Automotive Springs

Toy Springs

Miscellaneous Wire Forms

Upholstery Springs

Flat Spring Motors

Lock Springs

and all other Spring Purposes

When springs and wire forms are vital to the successful functioning of your product, the quality and characteristics of the wire used for making them is of the greatest importance to you. Wickwire Spencer Steel Company has specialized in the making of all types of spring wire and springs for over half a century. Their experience in producing a wire that forms more perfectly, that meets all requirements of use and gives longer life, is available to you. Invite the Wissco Engineer to tell his story. It will cost you nothing and will probably save you money.

WICKWIRE SPENCER STEEL COMPANY

New York City; Buffalo, Chicago, Worcester; *Pacific Coast Headquarters:* San Francisco; *Warehouses:* Los Angeles, Seattle, Portland. *Export Sales Department:* New York City.

WISSCO WIRE

by Wickwire Spencer

Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire—Valve Spring—Music—Clip—Pin—Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—Machinery Spring Wire—Reed Wire—Clock—Pinion—Needle-Bar—Screw Stock—Armature Binding—Brush—Card—Florist—Mattress—Shaped—Rope—Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wissco technical man on your wire problems, however large or small.

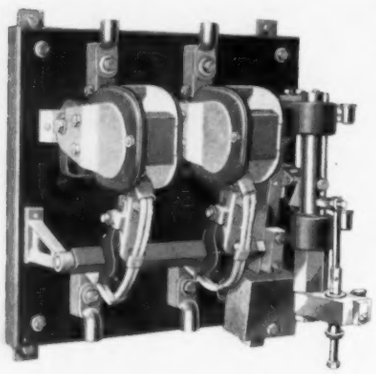
a feature of the sleeve clutch. It prevents a second stroke of the slide, even if the treadle is held down. The treadle must be raised and again depressed for a second stroke.

♦ ♦ ♦

Spot Welder Control—

Clark Controller Co., 1146 East 152nd street, Cleveland, recently placed on the market a new simple spot welder control, shown herewith. This development consists of an air-operated contactor connected directly to the welder head air cylinder. Being connected in this manner, it operates from the built up or back pressure of the welder cylinder, thereby eliminating the need for any kind of pressure switch, or back pressure relay. The air-operated contactor cannot close until the welder points have come together on the work which is to be welded, even though no pressure device is used.

Design of the air-operated contactor is such that one stroke of the piston both closes and opens the contacts of the electric welder circuit and does this accurately. It is claimed this feature also eliminates the need for any timing mechanism



Simple spot welder control introduced by Clark Controller Co.

or timing relay. Accurate timing as low as ½ cycle is guaranteed.

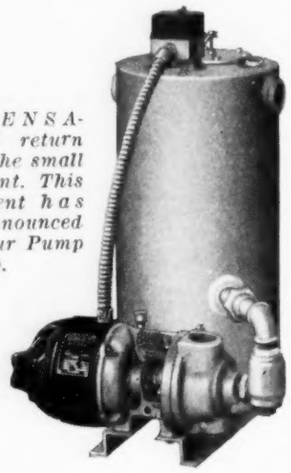
By eliminating both the pressure switch and timer, the air-operated contactor revolutionizes and simplifies the design of portable and other air operated spot welders. The control being operated entirely by air, no low voltage relays or push buttons, or transformers are needed for the operator's control circuit. Neither is any wiring required between the operator and welder.

♦ ♦ ♦

Condensation Return Unit—

Decatur Pump Co., Decatur, Ill., recently brought out a condensation return unit for the small steam plant. Features of the new unit, shown herewith, include automatic self priming; operating pressures up to 40 pounds per square inch; only one moving part; stainless steel shaft carried in oversize antifriction bearings; impeller and raceway of cast bronze; balanced hydraulic load, extremely compact design, neat in appearance.

The copper bearing steel tank of No. 12 gage has a diameter of 14



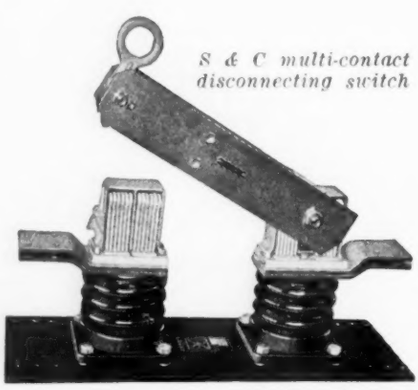
CONDENSATION return unit for the small steam plant. This development has been announced by Decatur Pump Co.

inches and is 22 inches high. An automatic controller switch is mounted on top and is connected directly with a copper ball float within the tank. This automatic float switch governs the operation of the motor and also provides overload protection.

♦ ♦ ♦

Multipoint Contact Knife Blade Switches—

Schweitzer & Conrad Inc., 4435 Ravenswood avenue, Chicago, is introducing a new line of multipoint contact disconnecting switches, one of which is shown in the accompanying illustration. Solid contacts are replaced by series of wire contact fingers —hard drawn copper wires swedged into a terminal block. Each contact wire has a rolled silver insert which makes silver-to-silver contact with an inlaid silver ribbon in the switch blade. A high percentage of actual contact surface is obtained and because of the uniform pressure, operation is surprisingly easy even on high ampere ratings. Inasmuch as there is less friction to overcome between blade and contact original ease of operation is retained. The double blade used is wide.



S & C multi-contact disconnecting switch

♦ ♦ ♦

Adjustable Orifice—

Bailey Meter Co., 1050 Ivanhoe road, Cleveland, is introducing an adjustable orifice which automatically shifts its position in accordance with major changes in rate of flow. The device, shown herewith, when installed in a pipeline connected to a standard recording and integrating fluid meter considerably widens the flow range which may be accurately covered by the meter.

The automatic adjustable orifice is similar in appearance to a hydraulically operated gate valve. The gate, however, is a sharp edged orifice segment, coefficients for which have been accurately determined. Its position varies the size of the orifice opening through which the fluid measured must pass.

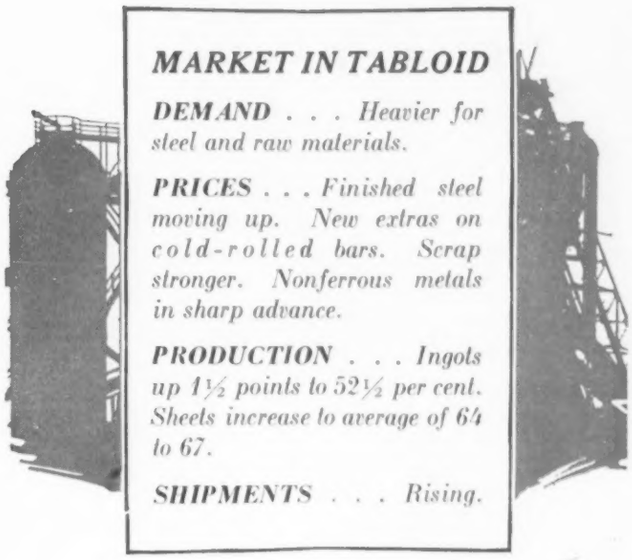
When the differential pressure across the adjustable orifice reaches

THIS adjustable orifice which automatically shifts its position in accordance with major changes in rate of flow, is a recent development of the Bailey Meter Co.

a predetermined minimum or maximum, a contactor within the meter casing energizes the solenoid valve, automatically changing the orifice opening to correspond with a new capacity. Simultaneously with this change, the integrator drive is shifted to a second Warren motor so it continues to accurately measure the total flow regardless of the orifice position. In addition to changing the orifice position and integrator speed, the contactor also energizes a small solenoid which operates an auxiliary recording pen to show the proper multiplying factor to be applied to the corresponding flow record on the chart.

Steel Rate, Scrap Prices Rise to Higher Levels

Markets Showing More Strength, on Demand For Steel, Raw Materials



MARKET IN TABLOID

DEMAND . . . *Heavier for steel and raw materials.*

PRICES . . . *Finished steel moving up. New extras on cold-rolled bars. Scrap stronger. Nonferrous metals in sharp advance.*

PRODUCTION . . . *Ingots up 1½ points to 52½ per cent. Sheets increase to average of 64 to 67.*

SHIPMENTS . . . *Rising.*

AFTER nearly two months of a strong, unbroken upward swing in steelworks operations, production still appears to be lagging behind demand, the steel rate last week advancing 1½ points to 52½ per cent.

Operations now are within 2 points of the former peak this year, early in February. Higher rates were attained in 1931, 1933 and 1934, but steelmakers see in the present movement factors inherently sounder than any heretofore since the pre-depression era. One evidence of this is the increasing extent to which industrial profits are being put back into capital equipment.

Automobile requirements are again giving more support to broad and diverse manufacturing requirements. Steel for the 1936 models is beginning to flow into Detroit, and is expected to continue on an ascending scale at least 30 days.

Chevrolet has authorized 250,000 of new models, the largest initial number of cars it ever has sanctioned, and is releasing parts and materials. Automobile production generally is scheduled to speed up immediately following Labor day. Output last week totaled 51,000, down 5000.

Farm implement buying has lost none of its strength, and record tonnages of galvanized sheets are moving to some of the southern and western farm districts. Sheeet production advanced to an average of 64 to 67 per cent.

Chesapeake & Ohio railroad will enter the market shortly for 35,000 tons of rails. New York Central is to open bids Sept. 4 on 7400 tons. Chicago rail mills have backlogs for four to six weeks operations.

Continental Oil Co., New York, is planning a 6-inch pipe line from Russell, Kans., to its Denver refinery, requiring 20,000 tons of pipe. Pacific Gas & Electric Co., San Francisco, has awarded 8600 tons for a 45-mile pipe line. Shape awards in the week declined to 13,808 tons, including 1130 tons for an Aluminum Co. of America building, New Kensington, Pa.

Pig iron and coke shipments are increasing. Tennessee Coal, Iron & Railroad Co. has lighted another blast furnace at Fairfield, Ala., and will put two more in operation in September.

Scrap prices continue to rise, heavy melting steel selling at Chicago at $13 a ton, highest in five years, and up $1 to $14.50, Pittsburgh.

Additional steel price revisions announced last week, and others in preparation, require small buyers to pay more, while for some products large consumers will pay relatively less. A generally higher price situation is being brought about through the medium of quantity extras.

Some makers of cold-finished carbon bars have already named new extras for fourth quarter. The base price is unchanged, but extras for lots of 500 pounds or less are raised $5 to $10 a ton, and size extras for rounds are up $2 to $5.

In the new method of quoting merchant wire and products, now in effect, the base price is reduced $4 a ton to the general trade, an amount equal to the former allowance to warehouses. However, changes pertaining to quantities raise the prices to small buyers, shutting out those who obtained jobbers' discounts to resell and unsettle the market.

Nonferrous metal prices are making spectacular advances, electrolytic copper being up $10 a ton on the most sustained consumer demand since 1929, and lead $3 a ton.

While the European war threat has not resulted in any large orders for steel, some equipment orders are being placed in this country, including 100 lathes to a Cincinnati builder from an automobile manufacturer in Italy.

Chicago steelworks operations last week advanced 3 points to 60 per cent; Youngstown 3 to 60; Pittsburgh 1 to 43; Buffalo 3 to 37; New England 17 to 73; eastern Pennsylvania ½-point to 33. Wheeling was down 8 to 76; Cleveland 8 to 51. Birmingham remained at 35½; Detroit 94.

STEEL's iron and steel price composite is up 4 cents to $32.72, on the advance in scrap, while the scrap index is up 37 cents to $12.33. Finished steel composite remains $54.

COMPOSITE MARKET AVERAGES

	Aug. 24	Aug. 17	Aug. 10	One Month Ago July, 1935	Three Months Ago May, 1935	One Year Ago Aug., 1934	Five Years Ago Aug., 1930
Iron and Steel	$32.72	$32.68	$32.64	$32.44	$32.35	$32.24	$32.90
Finished Steel	54.00	54.00	54.00	54.00	54.00	54.00	51.72
Steelworks Scrap	12.33	11.96	11.88	10.64	10.27	9.98	12.62

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Aug. 24, 1935	July, 1935	May, 1935	Aug., 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.80c
Steel bars, Chicago	1.85	1.85	1.85	1.85
Steel bars, Philadelphia	2.11	2.11	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60

Semifinished Material

Sheets bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	Aug. 24, 1935	July, 1935	May, 1935	Aug., 1934
Bessemer, del. Pittsburgh	$19.81	$19.81	$19.80	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	19.31	19.31	19.30	19.26
No. 2, foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	20.68	20.68	20.68	20.63
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.25	24.25	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	18.67	18.67	18.66	18.88

Scrap

Heavy melting steel, Pittsburgh	$13.25	$12.30	$12.00	$11.45
Heavy melt. steel, No. 2, east. Pa.	11.00	9.55	9.25	8.45
Heavy melting steel, Chicago	12.75	10.40	10.20	9.25
Rails for rolling, Chicago	13.75	11.25	11.05	10.50
Railroad steel specialties, Chicago	13.75	12.00	11.40	10.25

Coke

Connellsville, furnace, ovens	$3.25	$3.30	$3.60	$3.60
Connellsville, foundry, ovens	4.00	4.25	4.60	4.60
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.11c
Boston, delivered	2.22c
New York, del.	2.15c
Pitts., forg. qual.	2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.91c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

*Standard wire nails	$2.40
*Cement coated nails	2.40
*Galvanized nails, 15 gage and coarser	4.40
* do., 16 gage and finer	4.90

(Per pound)

*Polished staples	3.10c
*Galvanized fence staples	3.35c
*Barbed wire, galv.	2.80c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
*Woven wire fencing (base column, c.l.)	$58.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo			0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.			1.05
5100 0.80-1.10 Cr			0.45
5100 Cr. spring			base
6100 bars			1.20
6100 spring			0.70
Cr., Ni., Van.			1.50
Carbon Van.			0.95
9250	Carbon base plus extras		

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23¾-in.	
Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread ..... 70-10-5 off

Rolled thread, ½ x 6, smaller ..... 70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts ..... 70-10-5 off

Tire bolts ..... 60-5 off

Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Rolled thread machine, ½ x 6, smaller ..... 70-10-5 off

Step bolts ..... 70-5 off

Elevator bolts ..... 70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch ..... 70-10-5 off
Do., ½ to 1-inch ..... 70-10-5 off
Do., over 1-inch ..... 70 off

Hexagon Cap Screws

Milled ..... 85-10 off

Upset, 1-in., smaller ..... 87½ off

Square Head Set Screws

Upset, 1-in., smaller ..... 80 off

Headless set screws ..... 75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk.	Gal.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
⅛, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	
⅛—1½ inch, black and galv.	take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935 card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base...$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.25- 3.40
Connellsville, fdry.	4.00- 4.10
Connel. prem. fdry.	5.00- 5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.00
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol		15.00c
Toluol		30.00c
Solvent naphtha		30.00c
Commercial xylol		30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	4.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.08	.....	18.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem	20.99	21.49	.....	.....
Philadelphia from Birmingham	19.93	.....	19.1	.....
Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge

Valley furnace	18.00
Pitts. dist. fur.	18.00

Charcoal

Lake Superior fur.	21.00
Do., del. Chicago	24.25
Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional; each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality.

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga., Ky.,	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads, Quan. diff. apply.	

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper—Electro, del. Conn.	Copper—Lake, del. Midwest	Copper—Casting, refinery	Straits Tin—New York Spot	Straits Tin—New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Aug. 17	8.00	8.12½	7.50	48.75	48.25	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 19	8.50	8.62½	8.00	50.12½	49.20	4.20	4.05	4.60	*19.00	13.00	35.00
Aug. 20	8.50	8.62½	8.00	50.70	49.80	4.25	4.10	4.60	*19.00	13.00	35.00
Aug. 21	8.50	8.62½	8.00	51.00	50.12½	4.30	4.15	4.60	*19.00	13.00	35.00
Aug. 22	8.50	8.62½	8.00	50.00	49.25	4.35	4.20	4.60	*19.00	13.00	35.00
Aug. 23	8.50	8.62½	8.00	49.62½	48.75	4.35	4.20	4.60	*19.00	13.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
*Yellow brass (high)	14.00
*Copper, hot rolled	15.50
*Lead, cut to jobbers	8.00
Zinc, 100-lb. base	9.50
Tubes	
*High yellow brass	15.75
*Seamless copper	15.75
Rods	
*High yellow brass	12.50
*Copper, hot rolled	12.75
Anodes	
*Copper untrimmed	13.25
Wire	
*Yellow brass (high)	14.50

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	5.00- 5.25
*Cleveland	5.37½-5.62½
*Chicago	5.12½-5.37½
*St. Louis	5.25- 5.50
Heavy Copper and Wire	
*New York, No. 1	6.50- 6.75
*Chicago, No. 1	6.25- 6.50
*Cleveland	5.75- 6.00
*St. Louis, No. 1	6.50- 6.75
Light Copper	
*New York	5.25- 5.50
*Chicago	4.62½-4.87½
*Cleveland	5.00- 5.25
*St. Louis	5.25- 5.50
Light Brass	
*Chicago	2.75- 3.00
*Cleveland	2.62½-2.87½
*St. Louis	2.75- 3.00
Lead	
*New York	3.25- 3.37½
Cleveland	3.15- 3.40
Chicago	3.00- 3.25
*St. Louis	3.40- 3.50
Zinc	
New York	2.00- 2.25
*Cleveland	2.25- 2.50
St. Louis	2.65- 2.75
Aluminum	
Borings, Cleveland	7.50- 8.00
Mixed, cast, Clev.	12.50-12.75
*Mixed, cast, St. L.	12.00-12.50
Clips, soft, Cleve.	14.00-14.50
SECONDARY METALS	
*Brass ingot, 85-5-5-5	8.50
Stand. No. 12 alum.	16.25

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.75- 9.00
Boston, domestic	7.25- 7.50
Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.00-10.50
Chicago, No. 1	12.50-13.00
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.00-11.50
Detroit, No. 1	9.25- 9.75
Detroit, No. 2	7.75- 8.25
Eastern Pa., No. 1	11.50-12.00
Eastern Pa., No. 2	10.50-11.00
Federal, Ill.	8.75- 9.25
Granite City, R. R.	9.50- 10.00
Granite City, No. 2	7.75- 8.25
N. Y., deal, No. 2	7.50
N. Y., deal. barge	8.50
Pittsburgh, No. 1	14.00-14.50
Pittsburgh, No. 2	12.00-12.50
St. Louis	7.75- 8.25
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.00-10.50
Chicago, factory	11.50 12.00
Chicago, dealer	10.25-10.75
Cleveland	11.00-11.50
Detroit	9.75-10.25
E. Pa., new mat.	10.00-10.50
Pittsburgh	13.00-13.50
St. Louis	6.25- 6.75
Valleys	12.50

BUNDLED SHEETS

Buffalo	7.25- 7.75
Cincinnati, del.	7.00- 7.50
Cleveland	9.50-10.00
Pittsburgh	12.00-12.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.50- 7.00
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	14.00-14.50
Chicago (3 ft.)	14.00-14.50
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	12.00-12.50
Detroit	11.50-12.00
Pitts., open-hearth, 3 ft. and less	15.00-15.50
St. Louis, 2 ft.&less	13.00-13.50

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	12.50-13.00
Pittsburgh	14.00-14.50
St. Louis	11.00-11.50
Buffalo	11.50-12.00

STOVE PLATE

Birmingham	5.75- 6.00
Boston, dealers	3.50- 3.75
Buffalo	10.00-10.50
Chicago, net	8.00- 8.50
Cincinnati, dealers	6.50- 7.00
Detroit, net	6.50- 700
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	6.50- 7.00

COUPLERS, SPRINGS

Buffalo	13.25-13.75
Chicago, springs	13.50-14.00
Eastern Pa.	13.50
Pittsburgh	15.00-15.50
St. Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.25-13.75
Cleveland, billet, bloom crops	14.50-15.00
Eastern Pa., crops	14.50-15.00
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	14.00-14.50

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	10.75-11.25

SHOVELING STEEL

Chicago	12.50-13.00
Federal, Ill.	9.00- 9.50
Granite City, Ill.	7.75- 8.25

RAILROAD WROUGHT

Birmingham	8.00- 8.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	11.50-12.00
Chicago, No. 1, net	9.50-10.00
Chicago, No. 2	12.50-13.00
Cincinnati, No. 2	9.00- 9.50
Eastern Pa.	11.50-12.00
N. Y., No. 1, deal.	7.50- 8.00
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	9.25- 9.75

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.00-10.50
Chicago, No. 1	11.00-11.50
Cinci., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	7.25- 7.75
Detroit, No. 1, new	8.00- 8.50
Valleys, new, No. 1	12.00-12.50

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	3.00- 3.25
Buffalo	6.00- 6.50
Chicago	6.50- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	6.50- 7.00
Detroit	5.00- 5.50
Eastern Pa.	6.50- 7.00
New York, dealers	3.00- 3.25
Pittsburgh	9.00- 9.50
St. Louis	2.25- 2.75
Valleys	8.50- 9.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	7.00- 7.50
Cincinnati, dealers	5.00- 5.50
Cleveland	7.25- 7.75
Detroit	5.50- 6.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	7.00- 8.00

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.00- 7.50
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	7.25- 7.75
Detroit	5.50- 6.00
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	2.00- 2.50

PIPE AND FLUES

Cincinnati, dealers	5.50- 6.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	4.50- 5.00
Eastern Pa.	8.50
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.75- 6.00
Buffalo	10.00-10.50
Cleveland	9.50-10.00
Detroit	7.50- 8.00
Pittsburgh	11.00-11.50

FORGE SCRAP

Boston, dealers	4.50
Chicago, heavy	13.00-13.50
Eastern Pa.	11.50-12.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	10.50-11.00
Chicago, elec. fur.	12.00-12.50
Cleveland	7.00- 7.50
Eastern Pa.	9.50
St. Louis	7.00- 7.50

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	12.50-13.00
Chicago, net	14.25-14.75
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	12.50-12.75
Eastern Pa.	17.50
New York, dealers	13.25-13.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00-10.00
Boston, iron deal.	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	13.25-13.75
Chicago, iron	12.50-13.00
Chicago, rolled steel	13.50-14.00
Cincinnati, iron	9.50-10.00
Eastern Pa., iron	11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	15.00-15.50
St. Louis, iron	9.75-10.25
St. Louis, steel	11.75-12.25

NO. 1 CAST SCRAP

Birmingham	8.50- 9.50
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	11.75-12.25
Buffalo, mach.	12.50-13.00
Chicago, agri. net	9.50-10.00
Chicago, auto	10.50-11.00
Chicago, mach. net	11.00-11.50
Chicago, railr'd net	10.50-11.00
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	11.75-12.25
Detroit, net	10.00-10.50
Eastern Pa., cupola	11.00-12.00
E. Pa., mixed yard	9.50-10.00
Pittsburgh, cupola	14.00-14.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	9.00- 9.50
St. L., No. 1 mach.	10.00-10.50

HEAVY CAST

Boston, del.	5.50- 5.75
Buffalo, break.	9.50-10.00
Cleveland, break.	10.00
Detroit, No. 1, mach. net	10.50-11.00
Detroit, break.	8.50- 9.00
Detroit, auto net	10.75-11.25
Eastern Pa.	10.50
N. Y., break. deal.	6.25- 6.50
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	10.50-11.00
Boston, consum.	12.00-12.50
Buffalo	13.25-13.75
Chicago, R. R.	14.50-15.00
Cincinnati, agri. del.	9.50-10.00
Cleveland, rail	14.50-15.00
Detroit, auto	11.50-12.00
St. Louis, R. R.	11.50-12.00
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	8.00- 8.50
Buffalo	11.00-11.50
Chicago	13.50-14.00
Eastern Pa.	12.50-13.00
New York, dealer	8.50- 9.00
St. Louis	11.50-12.00

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS

Buffalo	12.75-13.25
Chicago	14.50-15.00
Eastern Pa.	13.00-14.00
Pittsburgh (heavy)	15.00-15.50
Pittsburgh (light)	14.00-14.50

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00-10.50
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.00

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.95c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.17c
Cleveland	2.95c
Detroit	3.04c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.26c
Pittsburgh (h)	2.90c
Philadelphia*	2.93c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.20c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.17c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.20c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young	2.30c-2.60c
SHAPES	
Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4 07c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.50c
New York	4.50c
Philadelphia*†	4.30c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.56c
Philadelphia	3 18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.58c
Boston	3.75c-3.90c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang.(f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c-4.31c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.05c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70–5
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, August 22

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.56 3 2 6	$13.72	1 14 0
Basic bessemer	15.56 3 2 6*	12.91	1 12 0
Hematite, Phos. .03-.05	16.31 3 5 6	.....	.....
SEMIFINISHED STEEL			
Billets	$27.39 5 10 0	$18.98	2 7 0
Wire rods, No. 5 gage	42.33 8 10 0	36.38	4 10 0
FINISHED STEEL			
Standard rails	$38.60 7 15 0	$36.34	5 10 0
Merchant bars	1.67c 7 10 0	1.14c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.64c 7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm	1.78c 8 0 0	1.54c	4 5 0
Sheets, black, 24 gage or 0.5 mm	2.05c 9 5 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.50c 11 5 0	3.19c	8 15 0
Bands and strips	1.89c 8 10 0	1.45c	4 0 0
Plain wire, base	2.50c 9 5 0	1.85c	5 7 6
Galvanized wire, base	2.39c 10 15 0	2.28c to 2.32c	6 5 6 to 6 7 6
Wire nails, base	2.66c 12 0 0	2.10c	5 15 0
Tin plate, box 108 lbs.	$ 4.48 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Sdy. pig iron, Si. 2.5	$16.81 3 7 6(a)	$17.24	260	$12.51	370	$25.42 63
Basic bessemer pig iron	17.43 3 10 0(a)*	12.60	190	11.15	330	28.04 (b)69.50
Furnace coke	4.11 0 16 6	6.30	95	3.89	115	7.67 19
Billets	27.39 5 10 0	28.51	430	18.25	540	38.94 96.50
Standard rails	1.83c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.91c 8 12 0	1.68c	560	.90c	600	2.01c 110
Structural shapes	1.94c 8 15 0	1.65c	550	.90c	600	1.97c 107.50
Plates, †¼-in. or 5 mm	2.01c 9 1 3	2.10c	700	1.05c	700	2.32c 127
Sheets, black	2.44c 11 0 0§	1.86c	620‡	1.24c	825‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.89c 13 0 0	3.45c	1,150	2.25c	1,500	6.77c 370
Plain wire	2.05c 9 5 0	3.39c	1,130	1.73c	1,150	3.17c 173
Bands and strips	2.08c 9 7 0	1.95c	650	1.26c	840	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 64.70 per cent over paper sterling.

—The Market Week—

Bars

Bar Prices, Page 58

Cleveland — Releases from forging shops on automotive work are heavier, and demand in general is well sustained. Considerable tonnages of steel and alloy steel bars are being placed by machinery and equipment manufacturers. The unusually strong demand for machinery is accounted for largely by the fact that automobile and rubber manufacturers, oil interests, steelmakers and others are on the profit side of the ledger and are turning a large share of earnings back into capital goods to replace obsolete equipment. Bar prices are steady.

Chicago — Steel bar sales and specifications show further gains, aided by heavier demand from the automotive industry as well as from miscellaneous consumers. Steady buying by farm implement and road machinery manufacturers continues, and the outlook is for a maintenance of recent consuming rates among important users. Producers are expected to announce fourth quarter prices around Sept. 1 and a continuation of recent quotations is anticipated.

Boston — Steel bar buying is steady with little change in shipments. Miscellaneous demand accounts for most, with indications of more activity on forging bars. Alloy bars are moving better, in small lots.

New York—Bar sellers find increasing inroads by brokers handling foreign steel. Prices on foreign bars are offered several dollars per ton under domestic.

Philadelphia — Commercial steel bars are moving fairly well, with producers expected to open books for fourth quarter soon. Keystone Drawn Steel Co., shared in the recent distribution of cold-finished bars for the Frankford arsenal, Frankford, Pa.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 59

Trade in bolts, nuts and rivets is irregular and prices show some weakening in some areas. At Cleveland specifications from automobile manufacturers exceed contract reservations, the industry having consumed more than it anticipated. New specifications are mainly for current models. Agricultural implement and railroad releases are lighter.

Demand at Chicago is slow, with agricultural implement manufacturers taking requirements steadily, with railroads buying lightly. Concessions from the regular discounts continue. Jobber stocks are low.

THIS NEW BRICK WILL INSURE FASTER HEATING, LOWER COSTS

AN INSULATING FIRE BRICK FOR USE UP TO 2600° F.

HERE'S the latest development in light-weight, semi-refractory brick! The new Armstrong's EF-26 will not crack, fuse, or spall at temperatures as high as 2600° F. And it offers all the operating advantages which have made Armstrong's EF Brick the choice of leading furnace builders and plant supervisors.

For Armstrong's EF-26 requires no fire brick protection, except when exposed to the direct impingement of the flame or slagging action. This permits the use of thinner walls, with a consequent sharper furnace, shorter heating time, speedier production line, and a real saving on fuel cost.

Armstrong's EF-26 is suitable for all types of furnaces—gas, oil, coal, or electric-operated. It is especially well suited for bright annealing furnaces since it contains no free iron to combine with the gases usually introduced into this type of furnace. The standard brick (9" x 4½" x 2½") weighs three pounds, and has a crushing strength (cold) of 450 lbs. per square inch, 545 lbs. at 1800° F., 265 lbs. at 2100° F., and 125 lbs. at 2500° F.

For samples and further information about Armstrong's EF-26—or about any of Armstrong's other brick—write to Armstrong Cork Products Co., Building Materials Division, 985 Concord Street, Lancaster, Penna.

IMPORTANT!

New, simplified markings of other brick in Armstrong's complete line

ARMSTRONG'S N-16 (formerly designated *Nonpareil 1600*) a light-weight insulating brick for temperatures up to 1600° F. behind the refractory.

ARMSTRONG'S A-25 (formerly designated *Armstrong 2500*) the standard insulating brick for temperatures up to 2500° F. behind the refractory.

ARMSTRONG'S EF-22 (formerly designated *EF*) an insulating fire brick for direct exposure up to 2200° F.

Armstrong's

HIGH TEMPERATURE INSULATION

Plates

Plate Prices, Page 58

REVISED chemical extras for steel plates have been announced by mills, effective Aug. 16. For plates over 36 inches in width the carbon extra is unchanged but for widths under 36 inches considerable reduction has been made. The following table shows the old carbon extras for all widths and the new for wide and narrow plates:

Carbon Extras Per 100 Pounds

Any mean Per cent	Old extras all widths	36 inches or under	Over 36 inches
0.10 to 0.25 incl.	base	base	base
0.26 to 0.40 incl.	$0.10	$0.10	$0.10
0.41 to 0.60 incl.	0.25	0.15	0.25
0.61 to 0.90 incl.	0.40	0.20	0.40
0.91 to 1.25 incl.	0.75	0.50	0.75

Pittsburgh — The pending item of special interest to the plate trade is the tonnage for naval vessels on which bids were taken a couple of weeks ago. Tonnage involved is estimated at around 25,000 tons, and with the addition of the complete requirements for 11 other ships which are to be built at government yards, the total plate tonnage may reach about 40,000 tons.

Cleveland — Fewer orders for heavy plates were received during the week. Tank builders also manifested less interest. Substantial tonnages were booked for General Electric motorframes and from some carbuilders who recently shared in distribution of 500 New York subway cars.

Chicago — Producers have adopted new carbon extras on plates. The new card applies lower extras on plates under 36 inches wide, with no change on wider sizes. Plate demand is principally in small lots except for tonnages required on various structural projects. Some shipments are being made for railroad equipment building and repairs, but new business of this type is light. Tank work generally is quiet.

Boston — Miscellaneous buying of plates is steady with an encouraging number of small orders usually for prompt shipment. The aggregate volume of such business is holding. Shipyards expect substantial navy orders soon. Repair work has been fairly active, but spotty. Plate prices are unchanged.

San Francisco—Bids have been opened on 750 tons for a reservoir in connection with the Cajalco dam and dike for the metropolitan water district, Los Angeles. One of the largest inquiries of the year is out and bids will be opened Sept. 4 for 4500 tons for a 36 to 48-inch welded steel pipe line of the Ogden canyon pipe line, Ogden, Utah, with alternate bids on cast iron and reinforced concrete pipe. Demand has improved of late and the outlook is encouraging.

New York—Plate sellers here have not yet formally opened books for fourth quarter but little change is expected. Buying is confined to small, scattered orders, pending placing of navy work. A fair tonnage of plates will be required for repair of 250 to 1000 steel hoppers for the Camden & Indiana, on which the New York Central is low.

Philadelphia — Pending award of the 13,000 tons of steel by the Sun Shipbuilding Co., local plate demand is spotty. District producers, however, appear to be receiving some fairly good tonnage from the outside, with the result that operations are not suffering. Platemakers will likely extend their present base prices into fourth quarter.

Seattle—Increased activity is noted in the plate market. Bids were opened Aug. 23 by Everett, Wash., for a pipe line extension, involving 800 to 1000 tons, welded, 24 and 36 inches. Puget Sound Machinery Depot, Seattle, has taken 280 tons involved in two pulp plant projects, for the Sound Pulp Co., Everett, Wash., a 17-foot digester, calling for 150 tons of 1⅜-inch plate is being built while an accumulator, 130 tons of 1⅛-inch plate is being constructed for the Puget Sound Pulp & Timber Co., Bellingham, Wash.

Contracts Placed

190 tons, soda ash silos, Procter & Gamble Co., Port Ivory, Staten Island, N. Y., to Chicago Bridge & Iron Works, Chicago.

100 tons, two oil storage tanks, specification 697-D, Boulder dam, Nev., to California Steel Products Co., San Francisco.

Unstated, tunnel plates, Ephriam project, Utah; general contract to Morrison-Knudsen Co., Boise, Idaho.

Contracts Pending

4500 tons, Ogden Canyon pipe line, Ogden, Utah., 36 to 48-inch welded, cast iron or reinforced concrete pipe; bids Sept. 4.

2800 tons, 8 miles of 36 to 48-inch welded steel pipe, La Mesa, Lemon Grove and Spring Valley irrigation district, La Mesa, Calif.; bids soon.

750 tons, reservoir, Cajalco dam, Los Angeles; bids opened.

400 tons, tank, Wilmington, Ill.

175 tons, welded steel pipe, specification 1770, Los Angeles; bids opened.

Tin Plate

Tin Plate Prices, Page 58

Pittsburgh—While new tin plate business is tapering off mill operations are being maintained surprisingly well for the end of the season. This is ascribed largely to the season which started a month late, extending itself by that period. Important consumers are holding some stocks at mills for shipment at convenience. The usual September quietness in tin plate apparently this year year will be deferred until October.

Sheets

Sheet Prices, Page 58

Pittsburgh—Shipments of sheets from mills so far in August are exceeding July by as much as July exceeded June. The Ford Motor tonnage of sheets recently distributed among half a dozen makers is understood to have aggregated 32,000 tons alone. Other automobile builders continue to defer placing their new model tonnage requirements for the expected large amounts, but these are confidently believed to be forthcoming shortly. Meanwhile, miscellaneous users of both common black and galvanized continue to expand their orders to the mills, so that while the number of individual orders is not much larger, yet the tonnages attached to each have been growing. Operations in black, galvanized, and full finished sheets have increased to an average between 64 and 67 per cent, with jobbing mills active at around 40 per cent. Chemical extras in hot-rolled and hot-rolled annealed sheets and on heavy and light cold-rolled sheets have been revised.

Cleveland—Automotive specifications were in lighter volume, and some releases which had been previously received for shipment during the week were held up for another week. General Motors units will resume Aug. 29, following a vacation, and a sharp rebound in automobile demand is expected shortly after Labor day. Miscellaneous orders in the aggregate are unusually heavy. A broadening in demand is noted for enameling sheets. Barrelmakers placed some substantial business.

Chicago—Sheet demand is expanding and continues at a relatively better rate than that for most other steel products. Automotive business helps to swell recent bookings, though business from miscellaneous consumers is substantial. Fourth quarter sheet prices are expected to be announced about Sept. 1. Intimations of changes in base quotations from recent levels are lacking.

Boston—Sheet demand has slowed up slightly, although blue annealed for small tank fabrication is fairly active in car lots. On the whole, industrial requirements are smaller. Sheet metal work is retarded by lack of building, while replacements and repairs are light. Jobbers are ordering close to requirements.

New York—Sheet sellers here re-

port little change over the past fortnight, with volume down from two weeks ago. However, sentiment continues good and general improvement is expected after Labor day. Sheet sellers have as yet taken no action for fourth quarter, although the expectation is that base prices at least will be reaffirmed. A change in extras to jobbers—possibly the elimination of the differential to warehouses—appears likely.

Philadelphia—At least one large sheet producer, it is reported, is considering the elimination of differentials to jobbers, according to reliable reports. Sellers so far, however, have taken no action in regard to fourth quarter prices, and the general expectation is that any changes that might be made will come in the form of extras, rather than any important revisions in the base prices. Sheet demand is fairly well sustained.

Cincinnati—Sheet mill rolling schedules remain about 60 per cent. Fresh purchasing during the past week was less brisk than in recent periods. Shipments to all classes of users are seasonally high, demand for galvanized being near mill capacity.

St. Louis—Demand for farm roofing material is said to be primarily responsible for the Granite City Steel Co. selling the largest volume of galvanized sheets since 1929. Hot rolled sheets are in better demand than for many years, with a fair amount of buying of hot rolled annealed sheets.

Birmingham, Ala.—Sheet mills are keeping up an active schedule of operation and shipments. Railroads are buying more. Demand promises to continue active for some time.

Pipe

Pipe Prices, page 59

Pittsburgh—Oil well supplies continue an encouraging feature in wrought pipe, and there is a sprinkling of small lots of larger-sized oil and gas pipe. Building construction projects are slow in maturing, which militates against hoped-for increases in demand for merchant pipe, but from a variety of sources is coming a fair aggregate of orders for standard pipe, keeping mills going at 40 to 45 per cent.

Cleveland—Small public works projects continue to develop in Ohio, bids being in on 500 tons of cast pipe for Byesville, O., and on 300 tons for Macomb, for early award. In steel pipe, steady shipments to jobbers feature the market.

Chicago—Chicago has placed 1595 tons of 6 to 16-inch cast pipe with Glamorgan Pipe & Foundry Co. and will take bids Aug. 30 on 385 tons of 20 and 24-inch. Activity elsewhere is improved slightly, and heavier orders are in prospect during the next 60 days. Most work in sight is for smaller municipalities. Cast pipe prices continue steady.

Boston—Cast pipe buying is sluggish in small fill-in lots, although Pittsfield, Mass., bought 150 tons. Inquiry is light. Since early spring aggregate volume of cast pipe bought has been below expectations. Miscellaneous demand for merchant steel pipe, moving largely through jobbers, is fairly well maintained. Steel pipe will benefit in construction of several hundred temporary and permanent residences at Eastport, Me., for the Quoddy project.

Globe Steel Tubes Co., Milwaukee, has been awarded a contract for seamless steel tubing, delivery at Brooklyn, Philadelphia and Charleston, S. C., by the navy department at $3275.48, bids Aug. 2, schedule 5646.

San Francisco—Continued improvement is noted in the cast iron pipe market, and bids have just been called for the largest tonnage of the year—6500 tons of 36 to 48-inch

THE manufacturer of farm implements and tractors must build unfailing service into his products by employing the best materials which the steel manufacturer can supply. The use of B & L Cold Finished Shafting is the first step in achieving maximum strength and running qualities. It imparts that sturdy dependability, which the farmer learns to expect in equipment built with B & L Cold Finished Steel Shafting.

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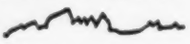
When it looks like this: 
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BOOTH 504
Exhibit Hall
Machine Tool Show

pipe for the Ogden Canyon pipe line, Ogden, Utah, to be opened on Sept. 4. Alternate bids also will be taken on welded steel pipe and reinforced concrete pipe. Awards were all confined to lots of less than 100 tons. Pending business includes 1995 tons for San Francisco.

The Continental Oil Co. is understood to be planning the building of a 6-inch welded steel pipe line from the oil field of Russell, Kans., to its Denver refinery. Twenty thousand tons of pipe will be used.

Pacific Gas & Electric Co., San Francisco, has awarded to Western Pipe & Steel Co., San Francisco, a contract for a 45-mile, 22-inch welded pipe line from Meter Station to San Francisco.

Seattle — While some small lots are moving out of stock, important specifications are lacking. Cast iron goods are needed and will be up for figures as quickly as federal funds are allotted. The largest tonnage pending is at Price, Utah, where bids were opened Aug. 16 for 1800 tons of 12-inch. Portland, Oreg., is reported to have awarded 200 tons of 6 and 8-inch cast iron pipe to unstated interests. United States Pipe & Foundry Co., Burlington, N. J. has been awarded 140 tons of 6 and 10-inch and accessories, by Omak, Wash. Havre, Mont. has authorized a pipe extension to the normal school campus. Everett, Wash., has appropriated $54,000 for six proposed extensions, 8, 12 and 20-inch. Bremerton, Wash., plans an 8-inch extension, providing federal aid is available.

Cast Pipe Placed

1595 tons, 6, 8, 12 and 16-inch, Chicago, to Glamorgan Pipe & Foundry Co., Lynchburg, Va.

1200 tons, pipe and fittings, Baltimore, to United States Pipe & Foundry Co., Burlington, N. J.

1000 tons, Guthrie, Okla., to United States Pipe & Foundry Co., Burlington, N. J.

325 tons, Del Rio, Tex., to United States Pipe & Foundry Co., Burlington, N. J.

200 tons, 6 and 8-inch, Portland, Oreg., to unstated maker.

150 tons, 6 and 8-inch, Pittsfield, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

140 tons, 6 and 10-inch and accessories, Omak, Wash., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

6500 tons, 36 to 48-inch, Ogden Canyon pipe line, Ogden, Utah; alternate bids on welded steel or reinforced concrete pipe; bids Sept. 4.

1800 tons, 12-inch, Price, Utah; bids in.

500 tons, water line, Byesville, O., PWA project; bids in.

385 tons, 20 and 24-inch, Chicago; bids to commissioner of public works, Aug. 30.

300 tons, water line, Macomb, O., PWA project; bids in.

252 tons, 6 and 8-inch, Minersville, Utah; bids soon.

225 tons, 4 and 6-inch, Victor, Idaho; bids soon.

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The ingenious design of frame, end heads and bearings for these new motors permits interchangeable parts . . . gives you easy convertibility for open type, splash-proof, fan-cooled or fully enclosed service applications.

Whatever kind of motor your job requires, you'll find it among these models ranging from ½ to 125 HP, Squirrel Cage or Slip Ring types. Larger shafts and bearings with liberal allowance for cooling make these new units first choice for heavy duty applications.

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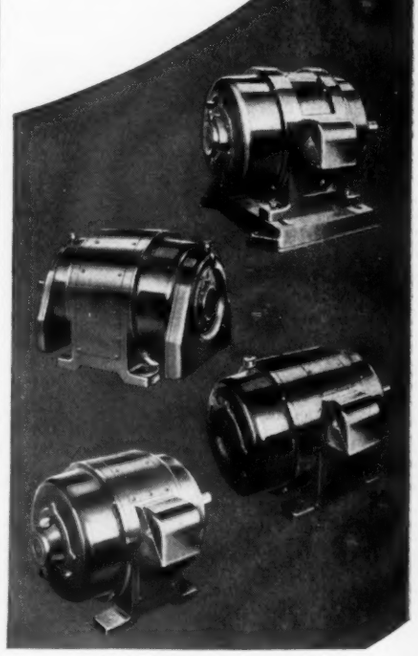

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200 tons, 6-inch, Bloomington, Idaho; bids soon.
150 tons, 48-inch and under, PWA projects, New York; bids in.
150 tons, 8 and 12-inch, Fitchburg, Mass.; bids in.
125 tons, 4 to 6-inch, Homedale, Idaho; bids opened.
Lowell, Mass., is taking bids on substantial tonnages of cast pipe, bids closing this week.

Steel Pipe Placed

8600 tons, 22-inch welded, 45-mile line, from Meter Station to San Francisco, for Pacific Gas & Electric Co., to Western Pipe & Steel Co., San Francisco.
500 tons, 20-inch, and miscellaneous material, dam project, Clinton, Mass., to Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.; plain end pipe, to Naylor Pipe Co., Chicago; Arthur A. Johnson Corp., New York, general contractor, instead of Taylor Forge & Pipe Works as reported in issue of Aug. 5.

Steel Pipe Pending

Unstated tonnage, 2000 feet of 37-inch, with couplings, Washington, Alco Products Co., New York, low.

Cold Finished

Cold Finished Prices, Page 59

A NEW schedule of extras for cold-finished carbon steel bars has been announced by some important producers for the fourth quarter, following the recent revision of extras on hot-rolled carbon bars which have been adopted generally for that period. (STEEL, Aug. 5, page 75.)

In the new cold-finished schedule the present base price of 1.95c, Pittsburgh, for lots of 10,000 to 19,999 pounds, of one size, shape, grade and shipment at one time, remains unchanged. So also do the present deductions for larger lots, and the present extras for amounts down to 500 pounds.

The new extra for lots of 300 to 499 pounds is 2.25c, compared with the current 2.00c, an advance of $5 a ton. The new extra for lots less than 300 pounds is 3.00c, compared with 2.50c, an increase of $10 a ton.

New extras for size of round bars also are set up, and these generally are higher than the present extras. For example, 13/16- inch to 1 7/16-inch take an extra of 55 cents per 100 pounds, instead of 40 cents; 1½-inch to 2-inch, 60 cents instead of 35 cents; and 4½ to 4⅞-inch $1.35 instead of $1. The list of extras for size on rounds, per 100 pounds, follows:

Inches:	
1/8 to 5/32	$3.00
3/16 to 7/32	2.00
1/4	1.25
5/16	1.00
3/8 to 7/16	.90
1/2 to 9/16	.85
5/8	.70
11/16 to 3/4	.60
13/16 to 1 7/16	.55
1 1/2 to 2	.60
2 1/16 to 2 1/2	.65
2 9/16 to 3	.80
3 1/16 to 3 3/8	.90
3 7/16 to 3 3/4	1.00
3 13/16 to 4 1/8	1.15
4 3/16 to 4 7/16	1.25
4 1/2 to 4 7/8	1.35
4 15/16 to 5 3/8	1.45
5 7/16 to 5 7/8	1.95
5 15/16 to 6 3/8	2.40
6 7/16 to 7	3.25
7 1/16 to 8	3.75

Only minor changes are proposed in the extras for squares. New extras are named for "turned and polished", and "turned and ground" shafting.

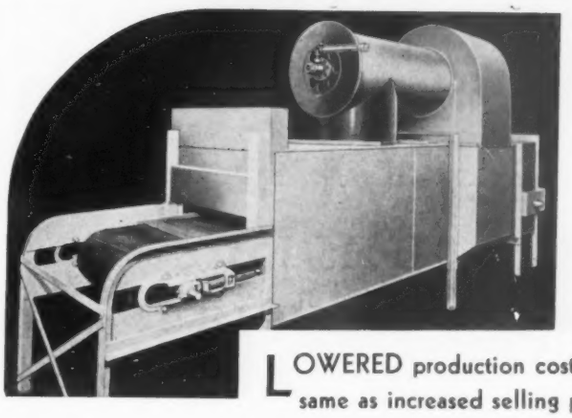
A statement representing the viewpoint of some of the interests proposing the new schedule says:

"The current card was adopted in September, 1932, and during the three years since that date no important changes have been made. The cold-finished industry, as a matter of fact, went through the two years of NRA codes without increasing its spread for processing.

"Marked adjustments will be found in the quantity extras up to 500 pounds, increases having been introduced to compensate more equitably both the manufacturer and the distributor for the added relative cost of han-

HERE'S A NEW BASIS

for figuring your operating profits



Continuous, gas-fired Morrison heat-treating furnace embodying the principle of forced convection with recirculation of heated air and providing new economies to its owners.

LOWERED production costs yield a profit the same as increased selling price. These profits can be stepped up to a material degree through the use of Morrison heat-treating equipment that is capable of effecting savings as high as 50% in this operation. Advanced principles, specialized design, skillful construction, and a real grasp of true working requirements are all contributing to the unparalleled success of Morrison installations in many plants and under widely varying conditions. What would your profits be if you could cut your heat-treating costs in two?

ADDITIONAL MORRISON ENGINEERED EQUIPMENT

Convection heating equipment for paint, foundry, ceramic, and lithographing ovens. Tank and process heating up to 1400° F.

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5005 EUCLID AVENUE » » » CLEVELAND, OHIO

dling small orders. As previously, parity between the mill and warehouse quantity extras will be maintained up to 1000 pounds of a kind and size for delivery at one time to one destination."

Apparently not all producers have adopted the new schedule as inquiries by STEEL to some of the large interests brought the response that they still are considering them.

Pittsburgh—Demand for cold-finished bars is widening continuously from miscellaneous sources and makers are fairly well satisfied even though automotive demand is slack.

Semifinished

Semifinished Prices, Page 59

Stocks of billets and sheet bars in the hands of consumers continue so small that practically immediate delivery is urged with each order from consumers. However, requirements have broadened to such an extent that mills here are beginning to extend their deliveries. Consumers have been caught somewhat unawares and it would appear likely they will order farther ahead and for larger quantities. The new forging billet set up is being received here with general satisfaction by bona fide forging concerns.

Coke By-Products

Coke By-Product Prices, Page 59

New York—Demand for distillates continues active at firm prices. Toluol and xylol supplies are moved to consumers as produced, with little spot material available. Phenol buying is steady, the navy closing this week on 102 tons for White Plains, Md. Napthalene volume is light.

Wire

Wire Prices, Page 59

MANUFACTURERS of steel wire have reduced base prices 20 cents per 100 pounds on unmixed single car lots of wire nails, woven fence wire, barbed and twisted barbless wire and bale ties, to the general trade, at the same time setting up a new scale of quantity extras. The new prices and extras are now in effect. Shipments on present contracts will continue for the remainder of this quarter.

The new prices at Pittsburgh and Cleveland are: Standard and cement coated wire nails, $2.40 per 100-pound keg; galvanized barbed and twisted barbless wire, $2.80 per 100 pounds; woven wire fence $58 per base column for 15½ gage and heavier; single loop bale ties $53 per standard bundle; polished staples $3.10 per 100 pounds and galvanized staples $3.35 per 100 pounds.

Quantity differentials on coated and bright nails, barbed and twisted barbless wire are as follows: Base, 40,000 pounds and over; 20,000 to 39,999 pounds, 5 cents; 10,000 to 19,999 pounds, 10 cents; 5000 to 9999 pounds, 15 cents; less than 5000 pounds, 20 cents per 100 pounds. On woven wire fence and bale ties the differentials are double those on nails for the same quantities.

On bright or galvanized staples in mixed cars the base is 5000 pounds; 2500 to 4999 pounds, 5 cents; 1000 to 2499 pounds, 10 cents; less than 1000 pounds, 20 cents per 100 pounds. On annealed and galvanized merchant quality wire and market wire in mixed cars 10,000 pounds is base; 5000 to 9999 pounds, 5 cents; 2500 to 4999 pounds, 10 cents; less than 2500 pounds, 20 cents per 100 pounds.

On less-carload shipments base is 10 cents higher, with new differentials applying in addition. On direct shipments jobbers will be allowed $1 per ton profit on carload shipments except on a straight carload of one

•

SHEARED STEEL PLATES

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ANY QUALITY
ANY ANALYSIS

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A. W. ROLLED STEEL FLOOR PLATES

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ALAN WOOD STEEL CO.

CONSHOHOCKEN, PA.

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commodity; on less-than-carload shipments the profit allowance is $2 per ton, under usual restrictions.

Change in quantity differentials will have the effect of eliminating application of jobber prices to numerous small-lot buyers who have been an unsettling factor in the recent wire market.

Pittsburgh—Makers of various steel commodities from manufacturers' wire continue to press for material for a wide variety of products from hardware to bolts. There is no let-down in demand for plain wire and wire products, and mills continue fairly well engaged with this class of production.

Cleveland—Demand for manufacturers' wire is well sustained, but shipments of agricultural material are lighter. Manufacturers' wire is not affected by the new system of pricing merchant wire according to quantities, which has been adopted generally by producers for fourth quarter.

American Steel & Wire Co. has been awarded the contract for furnishing the navy with $129,000 worth of flame-proof cable for ship use.

Chicago—New quantity differentials on wire products have been announced. Business in plain wire and merchant products continues moderately active and well up to the average of recent weeks. Automotive needs are commencing to expand and are counted on for substantial shipments in September. Demand from jobbers is slightly more active.

Boston—Wire buying is heavier, with specialties, manufacturers' and lighter products setting the pace. Operations in several departments have been increased. Demand for spring wire is brisk. Rope buying lags behind most products, but on the whole demand covers a broader range.

Incoming cable volume is heavier, due mostly to purchases by the navy. Simplex Wire & Cable Co., Boston, has booked marine cable for the navy at $25,628 and contracts went to American Electrical Works, Phillipsdale, R. I., at $10,185.70; bids July 30. New England mills will also secure a share of several thousand tons, on which bids closed last week.

Strip Steel

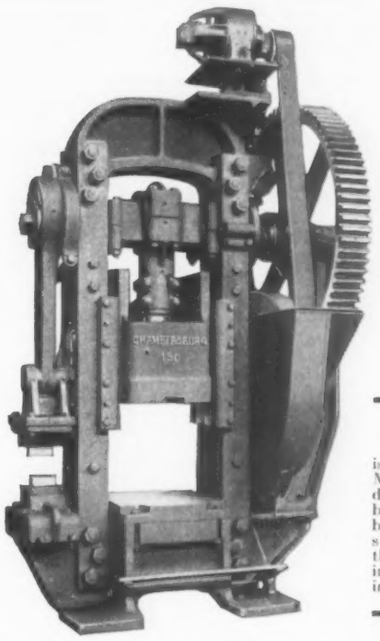
Strip Prices, Page 59

Cleveland—A little slackening in releases for steel strip was noted during the week, due principally to the fact General Motors held up specifications until Aug. 29, because of vacations. Mills, however, have good backlogs on which to work. Shovel manufacturers placed some fairly good orders.

Pittsburgh—Automotive requirements for wide strip are off for the moment but additional demand is indicated for the near future. Narrow strip is fair, with mills operating at about 40 per cent and prospects good for better rate.

Chicago—Strip demand is moderately more active. The tendency in automotive buying is upward and further increases are in sight for September. Miscellaneous buyers show no slackening in requirements and shipments compare favorably with those a month ago. Fourth quarter books are expected to be opened Sept. 1, with no change indicated in base prices.

Boston—Cold strip operations have gained. Hot-rolled producers are also booking heavier volume. Demand is strong for miscellaneous needs, and substantial shipments are being made to hardware, range builders and electrical appliance interests. The improvement, however, is rather irregular, some mills lagging behind others. The largest southern New England mill is rushed in some departments. Releases for automo-



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is a synthetic Nickel-Molybdenum alloy developed by Chambersburg. It combines the tensile strength of steel with the vibration-absorbing properties of gray iron.

Sixty-three Cents a Month!

The result of an investigation just completed, covering repair parts on a number of Chambersburg Trimming Presses with an aggregate service record of 2309 months, reveals an average repair part cost of 63 cents per month per press.

Now, with the added advantage of the use of Cecolloy in the construction of these presses, it seems logical that repair costs should drop even below this unusual record. The ruggedness of these presses, coupled with the fact that it is impossible to break or throw them out of alignment, by overload or other abuse, is responsible for their growing success.

Compare your own costs, then write for catalog and details.

CHAMBERSBURG
CECOLLOY
PRESSES

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

bile uses, notably for accessories, are heavier.

New York—Demand for strip is expanding mildly, with specifications highly diversified. Automotive accessory manufacturers are expected to be active factors early in the fall. Prices are unchanged.

Stripmakers have made some changes in chemical extras, on hot-rolled especially in manganese and silicon. In cold-rolled strip new thickness ranges for crown fender stock have been added, with deductions from base instead of extras.

Shapes

Structural Shape Prices, Page 58

New York—Structural contracts requiring large tonnages are few with active inquiry light. Small-lot miscellaneous buying is fairly active. Most of the larger projects in this district have been placed and a lull is expected until federal financed work under the PWA gets under way.

Pittsburgh—A number of small tonnages are pending for various buildings including factory additions, and postoffices. Prices are steady.

Cleveland—Awards are fairly numerous, but in moderate tonnags, including 165 tons for an administration building for Cleveland's easterly sewage disposal plant, 100 tons for a building for the Ohio Oil Co., Findlay, O., and 305 tons for two new bridge relocations in the Muskingum, Ohio, conservancy district. Among the few new projects up for bids is a warehouse for the Hazel-Atlas Glass Co., Zanesville, O., requiring 300 tons.

Chicago—Fairly large structural orders are pending, principally for public work, but activity in private construction is quieter. The latter applies to work involving less than 100 tons as well as to larger projects. Several thousand tons remain to be placed for Mississippi river locks and dams, bids opening Sept. 17 on dam No. 25. Specifications for plain material continue fairly active and involve larger tonnages than was true 60 to 90 days ago.

Boston—Structural steel contracts are few, but most awards are going to New England shops, the Cambridge, Mass., fabricator having a fair backlog. Small bridges in Connecticut, some placed and others closing Aug. 26, take about 200 tons. Indications are grade crossings at Weymouth, Quincy, Newbury and Waltham will be among the first sizable projects under the public works program to go forward in Massachusetts at an estimated cost of $1,270,000. Plans are complete and awaiting final approval at Washington.

Philadelphia—The Lehigh Structural Steel Co., Allentown, Pa., which recently booked the 12,000 tons required for the department of interior building in Washington, again has taken the week's largest tonnage to be awarded a fabricator in this district by having closed on 1000 tons for the postoffice at Wilmington, Del. The second largest order was booked by the Anthracite Bridge Co., Scranton, Pa., and involved 650 tons for a service building for the Scranton Electric Co., that city. Other contracts have been small, although action is expected almost daily in the

Behind the Scenes with STEEL

Arithmetic Lesson

DEMAND for reprints of material published in STEEL continues brisk. Since Jan. 1, through July 31, reprints have been made of 43 editorial articles as follows:

16,200 one-page reprints
4,600 two-page reprints
55,350 four-page reprints
18,500 eight-page reprints

This is a total of 94,650 reprints which have been distributed throughout the length and breadth of the land.

During the same period, 83,750 reprints of 48 different advertisements have been made, a grand total of 178,400, which, if placed end to end would make an 8-inch trail of paper 1,962,400 inches in length—all the way from Pittsburgh to Beaver Falls, Pa. And wouldn't that be a funny looking sight?

* * *

Unsung Poet

SOME weeks ago the foundry supply trade in the Pittsburgh district found in the morning mail the following announcement:

Pittsburgh, Pa.

Our business having expanded to a degree necessitating more space for its adequate transaction than that afforded by the quarters in the Park Building, this city, occupied by us during a number of years past, and convinced that an era of greatly increased activity impends, we determined to follow the trend of similar business in other metropolitan areas and seek another location somewhere in the suburbs away from the noises and smog-vitiated atmosphere of the city proper.

Accordingly, we acquired a site ideally located, adjacent and easily accessible to Pittsburgh's business center, where in the midst of an extensive lawn of velvety green and open on all sides to fresh and invigorating breezes and health-giving sunlight and vista of young pine, cedar and juniper trees and flowering shrubs we have erected a small, architecturally attractive office building completely furnished and equipped for our exclusive use.

Moreover, we realize fully that our enterprise with its attendant expenditures for material and man power is an innovation made possible only by the long and continued support of our friends to whom our grateful acknowledgments are made herewith and an invitation extended most cordially to visit us in the new home assured in advance of a warm and friendly welcome.

Faithfully yours,
FERDINAND G. SCHULTZ

We wonder why Mr. Schultz couldn't make a good thing out of writing prospectuses for new subdivisions—Dawdling-on-the-Hudson, Bullfinch's Sunny Acres and their ilk. Ho, for those invigorating breezes and the vista of young pine, cedar and juniper trees. You bring the alcohol and we'll supply the juniper. Mr. Schultz' entrancing description gives our smog-vitiated brain a distinct Camel-free lift.

* * *

Art Dept.

HOW do you like the sketches we have been running in this department the past few weeks? They are not done by the writer but by an accomplished confrere, a Mr. Etaoin by name. We've had five requests for the telephone number of the blonde sketched by Mr. E. in the Aug. 12 issue. Too bad, she's spoken for.

* * *

The Gay Eighties

FIFTY years ago these dog-days of 1935, *Iron Trade Review* (now STEEL) was regularly reporting events of the week in the industrial field, which through the haze of a half-century take on a faintly humorous tinge. Thus:

"Park Bro. & Co. are constructing a steel melting furnace having 30-ton casting capacity, which, when completed, will not be surpassed by any steel melting furnace in the world."

Then, a market flash:

"**Cleveland**—To read the dispatches and private telegrams from Pittsburgh and other points, received in this city, one would think that the market for manufactured iron is all on a big 'boom.' But, as yet, the 'boom' has not struck Cleveland . . ."

Probably got lost somewhere down around Youngstown.

—SHRDLU

Shape Awards Compared

	Tons
Week ended Aug. 24	13,808
Week ended Aug. 17	27,001
Week ended Aug. 10	21,260
This week, 1934	10,385
Weekly average, 1934	16,284
Weekly average, 1935	14,991
Weekly average, July	15,240
Total to date, 1934	601,246
Total to date, 1935	524,696

award of 2300 tons of shapes for the Archives building, Washington, on which McCloskey & Co., Philadelphia, are the general contractors. Shape makers have not as yet opened their books for fourth quarter, but it is believed base prices will be reaffirmed.

Birmingham, Ala. — Numerous small tonnages are being received, and fabricators' shops still are active. More business is anticipated during the coming month.

Seattle—Fabricating plants are fairly active. The final contract for the Bonneville, Oreg., powerhouse and dam project has been awarded to the Star Iron & Steel Co., Tacoma, Wash., 309 tons for gantry cranes and gates, on its bid of $96,420. Other awards have been previously announced. Colby Steel & Engineering Co., Seattle, general contractor for four high-speed cranes for the Grand Coulee, Wash., dam, has sublet fabrication of 400 tons of steel.

San Francisco — Interest centers around 6000 tons for transmission towers for the metropolitan water district, Los Angeles, bids on which were just opened. Awards in the week exceeded 1200 tons and brought the aggregate for the year to 68,811 tons, compared with 93,580 tons for the same period last year. The largest letting went to Pacific Coast Steel Corp. and called for 260 tons for a bridge at Wickenburg, Ariz.

Shape Contracts Placed

2500 tons, dam No. 1 on Mississippi river at Dresbach, Minn., to McClintic-Marshall Corp., Bethlehem, Pa.

1230 tons, lock for dam No. 13, at Fulton, N. Y., to Milwaukee Bridge Co., Milwaukee.

1130 tons, building, Aluminum Company of America, New Kensington, Pa., to American Bridge Co., Pittsburgh.

1080 tons, postoffice, Wilmington, Del., to Lehigh Structural Steel Co., Allentown, Pa.; Irwin & Leighton, Philadelphia, general contractor.

875 tons, lock No. 14, LeClaire, Iowa, to Independent Bridge Co., Pittsburgh.

675 tons, bridge, Athens, Ala., to Virginia Bridge & Iron Works, Roanoke, Va.

630 tons, service building, Scranton Electric Co., Scranton, Pa., to Anthracite Bridge Co., that city.

620 tons, power plant for TVA, Sheffield, Ala., to Wisconsin Bridge & Iron Co., Milwaukee.

550 tons, bridge, New Orleans, to Jones & Laughlin Steel Corp., Pittsburgh.

540 tons, building, General Aniline Co. Inc., Rennselaer, N. Y., to Belmont Iron Works, Philadelphia.

430 tons, city subway, section No. 1, Newark, N. J., to American Bridge Co., Pittsburgh, through J. Rich Steers Inc.

350 tons, state highway bridge, Columbia Falls, Mont., to McClintic-Marshall Corp., Bethlehem, Pa.

309 tons, gantry cranes and gates, Bonneville, Oreg., power project, to Star Iron & Steel Co., Tacoma, Wash.

278 tons, additional, postoffice, San Pedro, Calif., to unnamed interest.

260 tons, bridge, Wickenburg, Ariz., to Pacific Coast Steel Corp., San Francisco.

255 tons, mill building, Wheeling Steel Corp., Yorkville, O., to Riverside Steel Co.

210 tons, bridge for Missouri Pacific railroad, at Gasconade, Mo., to Virginia Bridge & Iron Co., Roanoke, Va.

200 tons, Wheeling & Lake Erie railroad bridge relocation at Dover in Muskingum, Ohio, conservancy district, to American Bridge Co., Pittsburgh.

195 tons, extension, Gauley tunnel, Electro Metallurgical Co., Glen Ferris, W. Va., to Babcock & Wilcox Co., New York.

185 tons, state bridge, Guadalupe county, New Mexico, to unnamed interest.

175 tons, bridge for Virginia railroad at Ingleside, W. Va., to Virginia Bridge & Iron Co., Roanoke, Va.

172 tons, Government Island park dam, Upper Snake river project, Idaho, specification 632, to unnamed interest.

167 tons, canal lining, specification 636, Uncompahgre project, Colorado, to unnamed interest.

165 tons, administration building, easterly sewage disposal plant, Cleveland, to McClintic-Marshall Corp., Bethlehem, Pa.

157 tons, Eastern telephone exchange, Cincinnati, to American Bridge Co., Pittsburgh.

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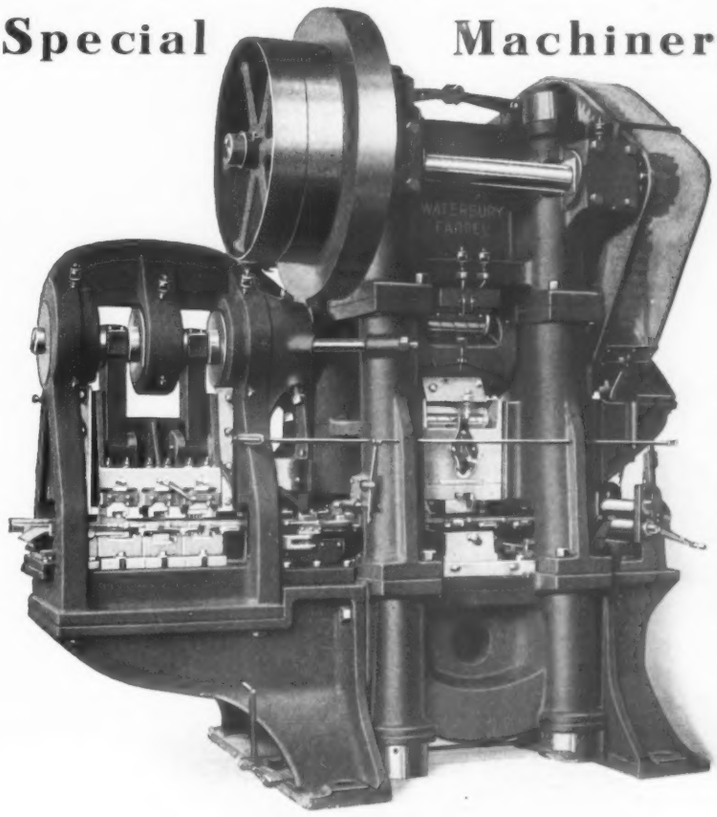

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CLEVELAND CHICAGO PHILADELPHIA

150 tons, grade crossings, Baltimore & Ohio railroad, Peth, N. Y., to Phoenix Bridge Co., Phoenixville, Pa.
140 tons, housing project, Indianapolis, to H. J. Baker Co., Indianapolis.
115 tons, building, International Harvester Co., Ft. Wayne, Ind., to Indiana Bridge Co., Muncie, Ind.
105 tons, Wheeling & Lake Erie railroad bridge relocation at Beach City in Muskingum, Ohio, conservancy district, to McClintic-Marshall Corp., Bethlehem, Pa.
100 tons, Masonic building, Harrisburg, Pa., to A. B. Rote & Co., Lancaster, Pa.
100 tons, alterations to Madison street bridge, Pottstown, Pa., to Shoemaker Bridge Co., Potstown.
100 tons, state bridge, Westboro, N. H., to Boston Bridge Works Inc., Cambridge, Mass.
100 tons, building, Ohio Oil Co., Findlay, O., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
100 tons, alteration, John Muir high school, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.
Unstated, factory building, Krebs Pigment Co., Baltimore, to Virginia Bridge & Iron Co., Roanoke, Va.

Shape Contracts Pending

6000 tons, transmission towers, metropolitan water district, Los Angeles; bids opened.
4000 tons, including 200 tons of piling, dam No. 8, Genoa, Wis.; Siems-Helmers Inc., St. Paul, low for general contract.
2851 tons, piling, Government Island, Oakland, Calif.; bids Aug. 27.
2300 tons, destructor plant, New York.
2400 tons, including 1200 tons of piling, Mississippi river dam No. 25; bids to United States engineers, Rock Island, Ill., Sept. 17.
2000 tons, postoffice, Bronx, N. Y., postponed to Aug. 27.
1000 tons, warehouses, South Jersey port commission, Camden, N. J.; bids Sept. 11.
1200 tons, heating and gymnasium buildings, Brooklyn college, Brooklyn, N. Y.; bids Sept. 4.
1000 tons, custom house, Denver; United States Fireproofing Co., Chicago, low on general contract.
750 tons, coal dumper, Norfolk, Va.
500 tons, terminal, Brownsville, Tex.
438 tons, butterfly valves and bulkheads, specification 629, Boulder dam, Nevada; bids opened.
400 tons, postoffice, Ft. Smith, Ark.
303 tons, state bridge to carry route 49, Broad street, across Cohansey river, Bridgeton, Cumberland county, New Jersey; bids Sept. 9 at Trenton. Structure will be 157 feet long with one fixed span and one single leaf 72-foot bascule span. Other steel required includes 66 tons reinforcing bars, and 43 tons of machinery.
300 tons, postoffice, Tallahassee, Fla.; bids Sept. 26.
300 tons, warehouse, Hazel-Atlas Glass Co., Zanesville, O.
250 tons, postoffice and court house, Fort Smith, Ark.
210 tons, bridge, Missouri Pacific railroad, at Osawatomic, Kans.
200 tons, state bridges, Wyoming.
200 tons, postoffice, Marquette, Mich.; bids Sept. 16.
190 tons, postoffice, Perth Amboy, N. J.; bids Sept. 24.
175 tons, parcel post building, Worcester, Mass.; bids Sept. 26.
175 tons, postoffice, Amsterdam, N. Y.; bids Sept. 16.
Unstated, two galvanized towers, Blackfeet Indian agency, Montana; bids in.
Unstated, 3-span, beam span, Glacier county, Montana; bids to bureau of roads, Portland, Oreg., Aug. 28.
Unstated, 3-span bridge, Flathead county, Montana; bids to bureau of roads, Portland, Oreg. Aug. 30.
Unstated, garage, fire station and industrial building, Puget Sound navy yard, Washington; funds authorized.

Quicksilver

New York—Small-lot quicksilver prices are easy here on competitive selling in a slow market. Small lots of 15 to 24 flasks, inclusive, are quoted down to $70 a flask, while round lots of 100 flasks are steady at $69, and single flasks are quotably up to $71.

Reinforcing

Reinforcing Bar Prices, Page 59

New York—Reinforcing steel inquiry has advanced sharply, highway and bridge requirements for New York and New Jersey being heavy, these states closing Sept. 4 and 9 on 2150 tons, mainly mesh. Awards are slightly more numerous and small-lot orders are holding.

Pittsburgh—Several projects involving concrete reinforcing bars stand out in this week's business, including the Brownsboro road sewer at Louisville, Ky., involving 263 tons, on which Lombardy Co., Temple, Pa., is low bidder. Miscellaneous building continues to take a fair tonnage, but the expected road work with government aid is slow to appear.

Cleveland—Carnegie Steel Co. has booked 650 tons for relocating Wheeling & Lake Erie railroad bridges in the Muskingum, Ohio, conservancy district, this being the largest award during the week. In Cleveland several thousand tons are pending for federal housing and other projects, but actual orders are small.

Chicago—A lull has developed in awards of larger lots except for some additional orders for Mississipi river locks and dams. Private building is confined to jobs involving less than 100 tons though these bulk fairly large in the aggregate. Plans have yet to be received for grade crossing elimination work in Illinois, the highway department currently seeking bids only on miscellaneous paving work.

Philadelphia — Reinforcing bar awards in this district have veen light, although few fair-size tonnages are pending, including 750 tons for the Reading, Pa., reservoir, on which

Concrete Awards Compared

	Tons
Week ended Aug. 24	2,538
Week ended Aug. 17	7,382
Week ended Aug. 10	2 689
This week in 1934	25,701
Weekly average, 1934	4,084
Weekly average, 1935	4,269
Weekly average, July	2,225
Total to date, 1934	172,891
Total to date, 1935	149,427

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Alloys	Pig Iron	Muck Bars
Ferro Manganese	Low Phos	Low Phos and Special
Ferro Chrome	English	The American
Ferro Silicon	French	Swedo Iron Co.'s
Calcium Silicide		
Silico Manganese		

Manganese Ore	Iron Ores	Chrome Ore
Open Hearth Use		Lump
Blast Furnace Use		Ground

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the Y.E.O. Construction Co., Philadelphia, general contractor, is low. Billet steel bars, cut lengths, are unchanged at 2.05c, Pittsburgh, or 2.36c, Philadelphia.

Boston—Reinforcing steel buying and inquiry is light. Connecticut closes this week on several small bridges and a highway, taking about 150 tons. Rail steel and rolling mill operations in this district are curtailed.

San Francisco—Few awards over 100 tons were booked during the week. So far this year 77,935 tons have been placed as compared with 72,682 tons for the corresponding period in 1934. The largest letting called for 428 tons for the San Pedro, Calif., postoffice, placed with an unnamed interest.

Seattle—Pending tonnages are small, lack of industrial and business construction being noted. Prices are firm. The Northwest Steel Rolling Mills, Seattle, booked 175 tons for state highway projects.

Reinforcing Steel Awards

650 tons, relocating Wheeling & Lake Erie railroad bridges in Muskingum, Ohio, conservancy district, to Carnegie Steel Co., Pittsburgh.

600 tons, lock No. 14, Le Clair, Iowa, to Inland Steel Co., Chicago.

278 tons, additional, postoffice, San Pedro, Calif., to unnamed interest.

275 tons, mesh, state highway, Oneida county, New York, to American Steel & Wire Co., New York; Davis & Stearns Inc., Whitney Point, N. Y., general contractor.

175 tons, state highway projects, Washington, to Northwest Steel Rolling Mills, Seattle.

175 tons, Government Island park dam, specification 632, upper Snake river project, Idaho, to unnamed interest.

167 tons, canal, Uncompahgre, Colo., project, to unnamed interest.

118 tons, state bridge, Guadalupe county, New Mexico, to unnamed interest.

100 tons, alteration, John Muir high school, Los Angeles, to unnamed interest.

Reinforcing Steel Pending

825 tons, sewage project, contracts 3, 4 and 5, Wards Island, New York; George H. Flynn Corp., New York, low, bids Aug. 19.

750 tons, reservoir, Reading Pa., Y. O. E. Construction Co., Philadelphia, low on general contract.

735 tons, Panama, Capitol Steel Co., Brooklyn, N. Y., low; bids Aug. 19.

600 tons, lock No. 25 in Mississippi river, at Cap Au Gris, Mo.; bids Sept. 17

500 tons, Mississippi river dam No. 25; bids to United States engineers, Rock Island, Ill.; Sept. 17.

381 tons, specification 1768, water and power department, Los Angeles; bids opened.

230 tons, state highway, route S-40, section 3, from Butlers Place to Ocean county line, 5.956 miles, Burlington county, New Jersey; bids Sept. 9 at Trenton.

220 tons, nurses' home, negro city hospital, St. Louis; Pelligreen Construction Co., St. Louis, general contractors.

220 tons, state highway, route 28, section 3, from Elmora avenue to Rahway Valley railroad, Elizabeth and Roselle Park, Union county, New Jersey, 2.635 miles; bids Sept. 9 at Trenton. Contract also includes one small span bridge extension.

Transportation

Track Material Prices, Page 59

Additional rail buying is indicated by recent inquiries, the Chesapeake & Ohio being in the market for 35,000 tons, which are expected to be placed early in September. New York Central will open bids Sept. 4 under the Clayton act on 7400 tons of rails and an additional quantity of accessories. Of this tonnage 4900 tons are for immediate shipment and 2500 tons for delivery before the end of the year. Norfolk & Western will close bids Sept. 4 on 3000 steel riser plates and 100 wrought steel wheels.

Chesapeake & Ohio has not announced low bidder on 100 automobile cars on which it took bids Aug. 19. New York Central is low on re-

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pair of 250 to 1000 hopper cars for the Cambria & Indiana, Philadelphia. This road entered the market several weeks ago and later withdrew its inquiry temporarily.

Baldwin Locomotive Works, Philadelphia, has booked one Mallet-type locomotive for Estrada de Ferro de Goyaz, Brazil. Edward G. Budd Mfg. Co., Philadelphia, is negotiating with four railroads for eight streamlined stainless steel trains, to cost about $4,000,000. RFC aid in financing is expected.

Rail Orders Pending

Chesapeake & Ohio, 35,000 tons; purchase early in September.

New York Central, 7400 tons; bids Sept 4 under Clayton act.

Buses Booked

American Car & Foundry Motors Co., New York: Thirteen 35-passenger street buses for Eastern Massachusetts Street Railway Co., Boston; eighteen 30-passenger street buses for Memphis Street Railway Co., Memphis, Tenn.; ten 35-passenger street buses for St. Louis Public Service Co., St. Louis; two 40-passenger street buses for Worcester Street Railway Co., Worcester, Mass.; one 38-passenger parlor car for E. Vanderhoof & Sons., West Orange, N. J.

Rogers Brown-Lavino Co., Philadelphia, pig iron, alloys, refractories and other products, will change its offices in that city, effective about Sept. 9, from the Bullitt building to the Integrity building, 1528 Walnut street.

Pig Iron

Pig Iron Prices, Page 60

Cleveland — Manufacturers of agricultural implements and heating equipment currently are taking larger shipments of pig iron than are automobile foundries. This situation, however, is expected to change beginning Sept. 1 when specifications call for a much larger movement to the latter interests. Producers expect at least two months of large shipments to automobile manufacturers. Demand is well diversified. A lake merchant furnace booked 5000 tons in the week, and a Cleveland consumer purchased 1000 tons of foundry iron from a Cleveland steelworks. No change in price is anticipated at the outset of the fourth quarter.

Chicago—Pig iron orders and shipments are increasing as a result of better foundry operations. Deliveries so far this month are 10 to 15 per cent heavier than in the comparable July period, with an increase of at least 15 per cent seen for August as a whole. Further gains are looked for in September. Jobbing foundries are slightly busier, while producers of castings for building purposes show additional gains. Fourth quarter books are expected to be opened Sept. 1, with the present market of $18.50, furnace, for No. 2 foundry and malleable likely to be extended. An advance later in the year is regarded as not unlikely.

Boston—Close to 1000 tons of pig iron from India, mostly sold before arrival at prices close to domestic quotations, reached this district last week. Domestic sales are up slightly, especially quick-delivery small-lot shipments, well distributed. Southern iron was purchased by two stove foundries at the 38-cent differential under the Everett, Mass., base. The Everett furnace has reaffirmed prices for next quarter. Stocks of foreign iron in storage at New England points have been materially reduced in some instances.

New York—Pig iron business is spotty, although general volume so far this month appears ahead of that for the corresponding period in July. Except for the New England producer, who opened books for fourth quarter recently at prevailing prices, no seller here has taken formal action for next quarter.

Philadelphia—Although still confined to small lots, pig iron specifications are more active. One large seller looks for shipments this month to be at least 50 per cent of those for July, and with few exceptions sellers report substantial gains for this month. There has been no fourth quarter interest as yet, and sellers have not opened their books for that position. It is generally believed, however, that current prices will be reaffirmed.

Buffalo — Rumors of increased prices for pig iron for the next quarter have caused a considerable portion of the trade to cover in increasing quantities. Shipments are gaining slowly and are now near the July level. Large inquiries are lacking. Seven furnaces are active.

Youngstown, O.—While demand for foundry and malleable pig iron is less in evidence, furnaces producing bessemer note the impulse of expanding steelworks operations in demand for iron for ingot molds. Production is considered unchanged here, and yard stocks in this district are ample for the present. Shipments continue fair.

Cincinnati—Pig iron shipments are at a higher level than during July, with steady demand in spot shipments a market feature. Fresh buying continues in conservative lots. The machine tool industry shows increases in casting needs. Inquiries involving pig iron needs for the remainder of the year are increasing in number, possibly inspired by anxiety over coal price developments.

St. Louis—Pig iron producers are operating at full capacity to take care of heavy demands for agricultural implements, and are expected to operate at this high rate indefinitely. Stove manufacturers are now getting into increased production and the melt in this industry is expected to be increased steadily as a result of heavy fall bookings. Jobbing busi-

ness also continues good.

Birmingham—Spot buying is more active and a better tone is noted. August will better July in delivery of pig iron. Surplus stock is being reduced. Tennessee Coal, Iron & Railroad Co. has blown in its second large blast furnace at Fairfield, making six active, four on foundry and two on basic. Tentative schedule indicates addition of two furnaces in September.

Toronto, Ont.—New business in the pig iron markets shows little or no change. Sales are confined to single car lots, totaling for the week about 500 tons. No future delivery contracts have been placed. Foundry activity is steady at, about 45 per cent. Production is sustained, with three stacks blowing. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 61

Pittsburgh—Scrap needs here become more pressing as melters expand operations. Some 3000 to 4000 tons of accumulated steel scrap has been bought for delivery at Pittsburgh, coming from the Massena, N. Y. plant of the Aluminum Co. of America. Export demand makes it difficult to draw scrap from the East to Pittsburgh. Quotations are higher as local collectors hold back on their stocks, rises of 50 cents to $1 being registered.

Cleveland—Although trading in steelmaking scrap here is practically absent, most activity being in blast furnace grades, prices have been advanced on steel grades in line with higher prices in the valley. An important melter there has distributed orders among brokers for approximately 7000 tons of steelmaking scrap. This and other purchases caused an advance to a top of $14 for No. 1, while Cleveland dealers are quoting a range of $12 to $12.50.

Chicago—Heavy melting steel has advanced 50 cents to the highest level of the past five years on mill purchases at $13. While recent price increases have tended to draw more scrap from outlying districts old material is not overly plentiful and most quotations are strong at present levels. Demand has been relatively more active for heavy melting steel than for other grades.

Boston—Scrap prices in New England are firm, machine turnings for Pittsburgh shipment advancing 25 to 50 cents, shipping point. Buying of heavy melting steel for export, mostly No. 2, continues brisk, with dealers paying unchanged prices at docks. Delivered prices for this grade to New England consumers are maintained. Close to 15,000 tons, including 3000 tons of rails, has been shipped for export or is being loaded. Some cast scrap is going to eastern Pennsylvania, although the movement is not heavy. Stove plate and textile machinery cast to New England consumers is slightly more active at strong prices.

New York—Scrap prices are firm with a steady movement of heavy melting steel, mostly No. 2, moving to eastern Pennsylvania from New Jersey. Buying at New York is largely for export. While dealers are generally paying $8.50 and $7.50, barge, for heavy melting steel, these prices have been bettered on special grades and large lots.

Buffalo—Dealers are making the market in the scrap trade here as consumers bid $11.50 for No. 1 heavy melting steel and dealers say they much prefer to buy than to sell at this level. In small lot sales of other materials the highest prices in many months have been established. Malleable has sold at $13.50 or more, short steel rails are quoted $14 to $15 and low phosphorus at $13.50 and up.

Philadelphia—No. 1 steel has advanced to $11.50 to $12, delivered, with a moderate tonnage recently placed at the outside figure. No. 2 steel is nominally unchanged, but strong. There appears to be a lively consuming interest in No. 2 steel, but buyers and sellers have not recently agreed on any sizable tonnage, which accounts for the nominal condition of the market. Turnings are stronger at $6.50 to $7., with sales at the outside figure and some sellers now asking as high as $8. No. 1 forge and railroad wrought are up nominally. Casting scrap prices are steady.

Detroit—Iron and steel scrap market continues strong, and sentiment leans toward a higher market. This week cast borings, mixed borings, old No. 2 busheling and short shoveling turnings are up 25 to 50 cents. Automobile plant offerings of scrap are light, due to cessation of operations for changeover to new models. A fair amount of scrap is being moved by water to Buffalo.

Cincinnati—The iron and steel scrap market here remains strong, with considerable dealer activity but no tonnage buying by important consumers. Quotations are unchanged. It is reported more than one-half of a recent Louisville & Nashville list of 30,000 tons was withdrawn.

St. Louis—Although the market for iron and steel scrap was slightly weaker, prices were unchanged, and hardly any business was transacted,

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in marked contrast to the activity and advancing tendency of the last few weeks.

Birmingham, Ala.—Movement of steel and iron scrap is light and larger melters are not interested. Prices have not been changed but are firmer.

Seattle—Recent firmness in domestic prices seems to have receded. Local buying is of small proportions, foundry demand being confined to specialty plants. Mills are well stocked and not adding to accumulations. The export situation is unchanged with Japan apathetic and China unable to finance requirements.

Toronto, Ont.—Trading in iron and steel scrap is seasonally quiet with sales below the average for the year. Demand is specialized and only a few grades are moving. Foundries are in the market for machinery cast and wrought scrap. Dealers are not accumulating scrap and have made no revision in prices.

Warehouse

Warehouse Prices, Page 62

Cleveland — Warehouse business shows remarkable steadiness for this time of the year. A slight improvement in volume of orders was noted by leading sellers here during the week. Warehouse prices will be adjusted in accordance with the new mill extras on various products, most of which do not go in effect until fourth quarter.

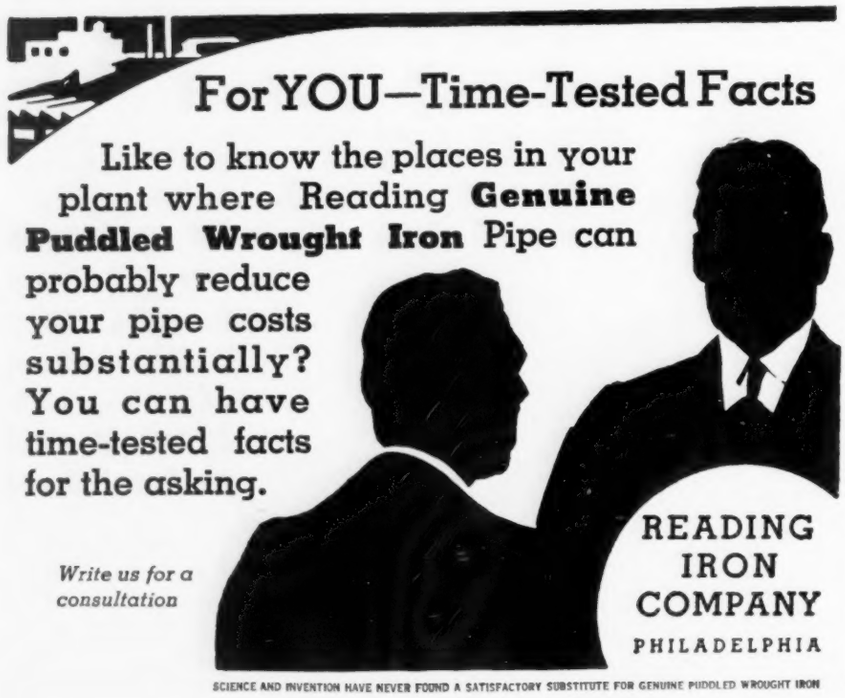
Chicago—Sales so far in August are equal to or better than the rate a month ago. This applies to both city and country demand. Buying is well diversified, though heavy products lack the activity experienced in bars, small shapes and flat rolled material. Prices are unchanged.

Boston—Warehouse sales, mostly in small lots, are steady, with the total volume satisfactory for this season. Distributors of specialties, including tool steels and alloys, are shipping more material.

New York — Volume is running ahead of last month. Incoming orders are numerous and well distributed as to products, although individual tonnages are small. While there are a few weak spots in prices, notably bolts and nuts, quotations are generally firm, apparently more so in northern New Jersey than elsewhere.

Cincinnati—Jobbers in iron and steel expect tonnage for August to surpass July. General industrial demand has maintained unusual vigor throughout the summer, and plant rehabilitation and expansion have accounted for considerable material. Sales for new construction are dull. Prices remain unchanged.

Seattle—Volume continues in advance of July. Although agricultural sections are not buying actively as yet, increased business is expected next month. Repair work is calling for fair tonnages of bars, sheets, mostly corrugated, and other out of stock items. Prices are steady, although reports of weakness have come from Portland, extending into some sections in the Spokane territory.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Steel in Europe

Foreign Steel Prices, Page 62

London—(*By Cable*)—Pressure of demand for steel and iron products in Great Britain caused curtailment of the holidays in the Middlesbrough district in the effort to meet needs of consumers. As most works are booked to the end of the year lighting of additional blast furnaces is expected. Demand for hematite pig iron is strong.

Production of semifinished steel is barely meeting demand of consumers and the continental quarterly quota already has been absorbed. The automotive industry is flourishing and steel exports are active, especially to South Africa.

Foreign trade for July was more advantageous to domestic industry, with an increase in exports and a decrease in imports. Exports in July were 205,741 gross tons, compared with 195,1000 tons in June, a gain of 10,641 tons. Imports in July were 90,250 gross tons, compared with 98,200 tons in June, a decline of 7950 tons.

Export trade from the Continent is reported as quiet, owing to the holiday season, with prospects fairly good. German producers have encouraging trade.

Reduction of import duties on steel and iron products into Great Britain to 20 per cent ad valorem, noted in STEEL last week, (Aug. 12, page 84), put into effect as from Aug. 8 the agreement between the British Iron and Steel federation and the International Steel cartel, which had been under discussion for some weeks. One result expected from the agreement is employment of 40,000 more workers in the British steel industry and 10,000 in mining.

Agreements have been reached on distribution of total imports into the United Kingdom and similar agreements are under discussion as to allocation of export tonnage of a number of products, which are expected to be closed shortly. It is provided that in case of failure to reach an understanding on any of these points by the end of the present year either party may terminate the main agreement on three months notice. A management committee has been set up, to be responsible for carrying out of all provisions and to supervise the sectional agreements to avoid conflicting plans. Arbitration is provided.

Metallurgical Coke

Coke Prices, Page 59

Beehive coke continues quiet and prices are steady at the former level.

Buying by melters in the Pittsburgh district is slow because of stocks. At Chicago shipments are about 10 per cent heavier than a month ago as foundry activity increases. Prices are expected to remain unchanged through September. Increased foundry activity at Cincinnati, because of heavy machine tool buying, has increased demand for foundry coke in that district. Producers at Birmingham, Ala., have fairly good stocks but have not reduced production. The price is steady at $6 for foundry grades.

Iron Ore

Iron Ore Prices, Page 61

Cleveland — Consumption of Lake Superion iron ore in July totaled 2,198,189 tons, 568 tons less than in June, according to the Lake Superior Iron Ore association. The association's report, including stocks on hand, follows:

	Tons
Consumed in June	2,198,757
Consumed in July	2,198,189
Decrease in July	568
Consumed in July, 1934	1,599,865
On hand at furnaces Aug. 1, 1935	25,226,815
On Lake Erie docks Aug. 1, 1935	4,282,019
Total at furnaces and Lake Erie docks Aug. 1, 1935	29,508,834
Total Aug. 1, 1934	29,921,962

Ferroalloys

Ferroalloy Prices, Page 60

New York—Ferromanganese shipments this month will exceed July, according to leading sellers. The trend has been upward for the past three months, unusual for the summer. Prices are unchanged at $85, duty paid, Atlantic and Gulf ports, with no action yet for fourth quarter. Domestic spiegeleisen, 19 to 21 per cent, also is steady, holding at $26, Palmerton, Pa., on lots up to 50 tons, and $24 on 50 tons and more.

Nonferrous Metals

Nonferrous Metal Prices, Page 60

New York—Displaying all signs of a forerunner to an early aumtumn business pickup of substantial proportions, major nonferrous metals moved into higher price ground on active demand last week.

Zinc—The market was generally quiet but sellers were well satisfied with the trend in view of heavy sales during the previous week which carried over into Monday. Prices advanced $2 a ton on that day.

Copper—Sales reached record heights with Monday's sales alone totaling 68,879 tons, largest single day's business in peace-time. Total sales through Thursday stood at 116,411 tons. Prices advanced ½-cent on this active demand to 8.50c, Connecticut, for electrolytic.

Lead—All classes of consumers rushed to cover September needs and prices jumped $3 a ton to 4.35c, New York, and 4.20c, East St. Louis. St. Joseph Lead Co. continued to place business in the New York market at a $1 premium on certain of its brands. Undertone continued strong and a further advance is likely if the buying pace is maintained.

Tin—Demand was only moderate with prices showing wide fluctuations. After advancing to 51.00c by midweek an easier tone developed due mainly to political uncertainties in Europe. Closing quotation on Straits spot tin was around 49.62½c.

Antimony—Moderate business was transacted in antimony with prices unchanged on the basis of 13.00c, duty paid, for Chinese spot.

Production

(*Concluded from Page* 18)

to 51 per cent, Corrigan, McKinney Steel Co. taking off three open hearths to operate eight; Otis Steel Co. continuing with four, and National Tube Co., Lorain, eight.

Central eastern seaboard—Fractionally higher at 33 per cent. While an easing off may set in around Labor day, producers look for the upward trend to extend well into fall.

SHEET MILL ACTIVITY SHOWS IMPROVEMENT IN JULY

Daily average steel sheet sales by members of the National Association of Flat Rolled Steel Manufacturers, Pittsburgh, increased 54 per cent to 6655 net tons in July. Production was up 1.6 per cent to 4694 tons, and shipments up 0.9 per cent to 4908 tons. This coincides with the reports in July that bookings were heavy, with specifications to be issued later, and in part accounts for the rise in production which continued in August.

Totals for July: Sales, 206,313 tons; production, 145,505 tons; shipments, 152,146 tons. Total sheet capacity in the United States for July was approximately 550,000 tons, and the association's figures are based on capacity for 302,500 tons. The association members' daily average sales were heavier than in any prior month since May, 1934, when they were 7945 tons.

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Labor

PRESIDENT ROOSEVELT Friday nominated the following to the national labor relations board, which succeeds the steel and other industry boards: Joseph W. Madden, of Pennsylvania, for 5-year term; John M. Carmody, New York, 3-year term; Edward S. Smith, Massachusetts, for one year.

BAR IRON WAGES UNCHANGED

Wage rates in bar iron mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will remain unchanged for September and October. The bimonthly settlement, announced Friday, shows boiling, 12-inch and bar mills on a 2.00c card, and guide and 10-inch mills on a 2.10c card.

LADISH WALKOUT ENDS

Ladish Drop Forge Co., Cudahy suburb of Milwaukee, resumed production Aug. 19 after being closed since Aug. 8, due to almost complete walkout of about 550 employes to enforce a demand for a 20 per cent wage increase, among other demands. The company's proposal to increase wages 3 cents an hour was accepted.

BUCYRUS INCREASES WAGES

Bucyrus-Erie Co., South Milwaukee, Wis., increased hourly wages for shop employes Aug. 16, and will raise office workers effective Sept. 1. About 1200 workers will benefit, 900 in the shop.

WESTINGHOUSE UPS PAY 5%

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is increasing wage rates of hourly-paid employes 5 per cent, retaining 40 hours as the basic work-week.

COST OF LIVING DECLINES

Cost of living of wage earners in July declined 0.1 per cent from June, standing at 121.1 on the basis of 1923 equalling 100, according to the National Industrial Conference board.

Meetings

AMERICAN Gear Manufacturers association has scheduled its semiannual meeting at the General Brock hotel, Niagara Falls, Ont., Oct. 14-15. J. C. McQuiston, Wilkinsburg, Pa., is secretary.

FRENCH SCHEDULE FOUNDRY CONVENTION FOR OCTOBER

Annual congress of the Association Technique de Fonderie, of France, will be held in Paris from Oct. 20 to 26 in conjunction with the seventh international congress of mines, metallurgy and applied geology, organized by Societe de l'Industrie Minerale, Comite Central des Houilleres de France, Comite des Forges de France, Societe Geologique de France, and Revue de Metallurgie, and under the patronage of the President of the Republic.

The chairman of the congress committee is Henry Le Chatelier, of l'Institute de France, and the organization committee is headed by Leon Guillet, also a member of l'Institut de France. The metallurgical section, of which the foundry congress will be a subsection, is presided over by Professor Portevin, past-president of Societe des Ingenieurs Civils de France.

A.S.T.M. SETS MEETING DATES

American Society for Testing Materials announces that its thirty-ninth annual meeting will be held in Atlantic City, June 29-July 3, 1936. These dates, one week later than usual, were selected because better hotel accommodations are assured. The 1936 regional meeting will be held in Pittsburgh, March 4, and will feature a symposium on high-strength constructional metals. In connection with this meeting, the society will conduct its spring group meetings of committees, March 2-6.

Convention Calendar

Sept. 9 — Associated Machine Tool Dealers. Annual meeting at Hotel Cleveland, Cleveland. Harry Barney, Barney Machinery Co., Koppers building, Pittsburgh, is secretary.

Sept. 11-21—National Machine Tool Congress (Third). In Cleveland, under auspices of the National Machine Tool Builders' association; Machine Shop Practice division, American Society of Mechanical Engineers; and Production Activity division, Society of Automotive Engineers. Herman H. Lind, 1220 Guarantee-Title building, Cleveland, is general manager, National Machine Tool Builders' association.

Sept. 11-21—National Machine Tool Exposition (Third). In Public Auditorium, Cleveland, under auspices of the National Machine Tool Builders' association. Roberts Everett Associates, 232 Madison avenue, New York, are managers.

Sept. 14-16—Special Tool, Die and Machine Shop Institute. Annual convention at Hotel Statler, Cleveland. George J. Huebner, 1225 Guarantee Title building, Cleveland, is secretary.

Sept. 16-18—Iron and Steel Institute (British). Autumn meeting at Manchester College of Technology, Manchester, England. K. Headlam-Morley, 28, Victoria street, London, S.W.1, is secretary.

Sept. 18-20—National Industrial Advertisers association. Annual convention in William Penn hotel, Pittsburgh. Allan E. Beach, Littleford Bros., 453 East Pearl street, Cincinnati, is secretary.

Sept. 20-21 — American Ceramic society. Meeting of Refractories division at Pennsylvania State college, State College, Pa. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

Men of Industry

(*Continued from Page* 21)

Mason P. Rumney, vice president; Harold F. Wardwell, vice president; and Edgar R. Ailes, secretary-treasurer.

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James L. Riley, identified with the American Sheet & Tin Plate Co. since 1912, has been appointed manager of stainless steel sales for Peter A. Frasse & Co. Inc., New York, effective Sept. 1.

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Officers for 1935-1936 of the Association of Iron and Steel Electrical Engineers are as follows: President, G. R. Carroll, electrical superintendent, Jones & Laughlin Steel Corp., Aliquippa, Pa.; first vice president, F. W. Cramer, superintendent of electrical construction, Republic Steel Corp., Youngstown, O.; second vice president, J. A. Clauss, chief engineer, Great Lakes Steel Corp., Ecorse, Mich.; director at large, C. A. Kral, assistant general manager, Wheeling Steel Corp., Steubenville, O.; honorary directors, J. Farrington, electrical superintendent, Wheeling Steel Corp., Steubenville, O., and E.Friedlander, Pittsburgh; past presidents, W. H. Burr, electrical and mechanical superintendent, Lukens Steel Co., Coatesville, Pa., and W. E. Miller, electrical and mechanical superintendent, Bethlehem Steel Co., Johnstown, Pa.; treasurer, C. H. Hunt, assistant to president, Weirton Steel Co., Weirton, W. Va.; secretary, J. L. Miller, assistant chief engineer, Carnegie Steel Co., Youngstown, O.; directors—C. J. Smith, superintendent of auxiliary departments, Illinois Steel Co., South Chicago, Ill.; H. G. R. Bennett, assistant general superintendent, Carnegie Steel Co., Duquesne, Pa.; Stanley Grand-Girard, mechanical and electrical superintendent, Sharon Steel Hoop Co., Sharon, Pa.; C. R. Tinsley, electrical and mechanical superintendent, United States Pipe & Foundry Co., Bessemer, Ala.; M. J. Conway, fuel engineer, Lukens Steel Co., Coatesville, Pa.; C. C. Pecu, lubrication engineer, Bethlehem Steel Co., Lackawanna, N. Y.; C. C. Wales, chief engineer, Otis Steel Co., Cleveland; L. F. Coffin, superintendent mechanical department, Bethlehem Steel Co., Sparrows Point, Md.; J. A. Voss, manager, industrial relations, Republic Steel Corp., Youngstown, O.

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J. P. Boore, who has been acting as assistant to the president of the

Summerill Tubing Co., Bridgeport, Pa., for two years, has been elected vice president and is moving from Pittsburgh to Bridgeport.

George P. Kraemer has been elected secretary and treasurer. He will continue as assistant manager of the Philadelphia branch of Edgar T. Ward's Sons Co. and devote a part of his time to the Summerill interests.

N. H. Wolf, at Bridgeport, continues as general manager, which position he has occupied for many years.

H. M. Brightman, located at Pittsburgh, will continue as assistant to the president and devote most of his time to research and other engineering problems.

E. L. Parker continues as president, which position he also holds with the Columbia Steel & Shafting Co. and its subsidiary, the Edgar T. Ward's Sons Co., of Pittsburgh.

♦ ♦ ♦

George Kirtley, formerly in charge of the Pittsburgh district for the Plymouth Locomotive Works, division of the Fate-Root-Heath Co., Plymouth, O., has been appointed assistant to the vice president, E. W. Heath, in charge of locomotive sales and advertising, with headquarters at Plymouth.

Mr. Kirtley brings to this new position 12 years of experience in the application of steam and internal-combustion locomotives to a wide variety of services, which includes the large Butane-burning switching locomotive recently installed by the Acme Steel Co., Chicago.

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O. R. Lane has been appointed representative in Oklahoma, Arkansas, Tennessee, eastern Missouri and southern Illinois and Indiana for the Kennedy Valve Mfg. Co. He will have headquarters at 455 Paul Brown building, St. Louis.

Equipment

Chicago — Machinery and equipment demand continues moderately active and generally equal to or better than the rate of the past few months. Activity among various types of steel fabricators is reflected in further gains in demand for welding equipment, while machine tool sales hold at a substantially better rate than a year ago. Heavier equipment also shows the best activity in several years. Pending business in overhead cranes includes five of 10 to 75-ton capacity for Granite City Steel Co. Work on the new mill of American Sheet & Tin Plate Co. at Gary, Ind., is progressing rapidly. Cranes for the new building are to be shipped shortly.

Foundry equipment business generally is steady, gains over the volume a year ago continuing marked. Milwaukee Foundry Equipment Co. is shipping two core grinders, having 72-inch diameter tables, to the Stalin auto plant, Moscow.

Boston—Substantial purchases of machinery recently for bearing plants have added to backlogs of several New England shops, notably in the Worcester district where some builders are operating two shifts. Considerable machinery for 1936 automobile models also is being quietly placed. The best some shops can do on delivery is 10 weeks. Inquiry is active and a moderate volume of foreign business continues to be placed in addition to recent heavy Russian orders. There is some indication of delay in placing orders by some buyers until after the Cleveland show.

New York—Machine tool buying is well sustained, with several attractive foreign orders placed, including approximately 100 lathes by an automobile factory in Italy, to a Cincinnati district shop. Domestic buying and inquiry is well spread including a wider range of industries with individual orders for three or four tools more frequent. High-production special machines are the most active. New Departure Mfg. Co., Bristol, Conn., has placed approximately 30 miscellaneous tools, including grinding equipment. Inquiry in the Philadelphia district continues active, especially lathes for the navy.

Construction and Enterprise

Illinois

CHICAGO — Crystal Pure Candy Co. Inc., 2611 West Chicago avenue, plans installation of electric power equipment in new 1-story factory addition, 100 x 125 feet, costing about $50,000. (Noted July 8).

EAST MOLINE, ILL. — International Harvester Co., Michigan avenue and Harrison street, Chicago, will more than double plant capacity here with an addition to main manufacturing building, a new steel storage building and a new boiler house. Cost of the program will be $1,000,000.

Ohio

ATHENS, O.—Council has authorized L. B. McCune, mayor, to make application for $400,000 loan and grant to finance construction of municipal electric light plant.

CLEVELAND — Cleveland Electric Illuminating Co., 75 Public Square, has filed plans for new power substation in Shaker Heights district, for booster service. Cost close to $75,000 with equipment.

CLEVELAND — Boldt-Rapp Co., 2175 Ashland road, has been awarded general contract for erection of a 2-story factory building designed by Herman W. Maurer, in Garfield Heights, (Cleveland) in conjunction with Parker Street Castings Co., Dall Mfg. Co., David Round & Son, and the Cleveland Chain & Mfg. Co.

COLUMBUS, O. — Department of public service, City hall, W. J. Lucks director, has plans for new 1-story mechanical blower and pumping station, 100 x 190 feet, for waterworks system. Cost close to $300,000, including equipment. Bids will be asked soon for four large centrifugal pumping units with accessories, motor-driven blowers and auxiliary equipment.

DAYTON, O. — Monarch Engineering Co., First street and Patterson boulevard, manufacturer of water system equipment, plans installation of electric power equipment in connection with rebuilding of portion of 3-story plant recently damaged by fire.

DOVER, O. — Plant of Marsh Wall Tile Co. was severely damaged by fire here recently.

ST. MARYS, O. — Municipality plans electric light and power plant, costing approximately $185,000. Will apply to PWA for funds.

TOLEDO, O. — Electric Auto-Lite Co., Royce G. Martin president, has acquired the Alemite Die Casting & Mfg. Co., with plants in Chicago and Woodstock, Ill., for expansion purposes. It also has purchased the Central Brass & Fixture Co., Springfield, O., manufacturer of bumpers. The new companies will be managed from Toledo headquarters.

Indiana

EVANSVILLE, IND. — Board of directors, state hospital, Lincoln avenue, Dr. J. H. Hare, superintendent, plans erection of new boiler and engine house, costing about $40,000 with equipment.

EVANSVILLE, IND. — East Dayton Tool & Die Co., 310 East Second street, Dayton, O., plans installation of electric power equipment in its new 1-story branch plant here. Estimated cost $40,000 (Noted Aug. 5).

Michigan

KINGSFORD, MICH. — Municipality plans electric light and power plant. Cost will exceed $40,000.

MONROE, MICH. — Pattern works and foundry of Vincent Schnorberger recently sustained damage by fire.

Connecticut

BRISTOL, CONN.—City has preliminary plans for disposal plant, costing $50,000. PWA project. C. W. Buell, City hall, engineer.

Massachusetts

BEDFORD, MASS. — Doyle & Russell, Central National Bank building, Richmond, Va., has been awarded the general contract for a boiler house addition, boiler and equipment for the veterans' hospital here, at $58,400.

NEW BEDFORD, MASS. — W. Tallman, architect, 222 Union street, will soon let contract for 1-story, 53 x 95-foot brewery addition and al-

terations to Dawson's Brewery Inc. Cost will exceed $40,000.

Maine

PORTLAND, ME. — City manager, 389 Congress street, has plans under way for new steam power plant at city hospital. Bids for boilers and other equipment will be asked soon. (Noted July 22).

New York

NEW YORK — Cellu-Type Plate Co. Inc. has been organized to manufacture machinery and supplies, by Herman & Ernst, 122 East Forty-second street.

NEW YORK — Dorr Co. Inc., engineers, 247 Park avenue, and Cooper building, Denver, has signed a contract for erection of a large purification plant, which will remove 75 per cent of the silt carried by the Colorada river at the Imperial dam, 15 miles northeast of Yuma, Ariz. The plant will purify 8,000,000,000 gallons of water per day.

ROCKVILLE CENTER, N. Y.—Village plans expending $250,000 for municipal light plant. PWA project.

VALATIE, N. Y. — City plans municipal electric light and power plant. Appropriation of $109,000 has been secured through federal aid for this and a warehouse building.

WEBSTER, N. Y. — Village, W. R. Hawley mayor, plans a waterworks system, including 250,000-gallon tank, and pumping units, costing about $200,000.

Pennsylvania

CHARLEROI, PA. — Macbeth-Evans Glass Co. has awarded contract for construction of glass factory to Austin Co., 16112 Euclid avenue, Cleveland. Estimated cost will exceed $28,000.

HOMESTEAD, PA.—Carnegie Steel Co., Pittsburgh, plans installation of heavy-duty motors and controls, motor generator sets, regulators, electric cranes and hoists, conveyors and other equipment in new mill unit here, for production of standard and special steel plates. Cost estimated over $5,000,000.

PHILADELPHIA — Commanding officer, navy yard, plans installation of motors and controls, electric hoists, conveyors, cranes and other equipment in proposed new heavy machinery storage and distributing building. Appropriation of $600,000 is being arranged for this project.

PITTSBURGH — A. M. Byers Co., Clark building, will spend approximately $500,000 to branch out into the manufacture of steel pipe in addition to wrought iron pipe. The pipe will be manufactured at the company's new pipe mills on Eighth street, Southside.

WASHINGTON, PA. — Molybdenum Corp. of America, 2911 Grant building, Pittsburgh, has awarded contracts for construction of a steel and concrete factory here for extraction of lead, gold and silver from ore to be shipped from Arizona. Plans provide for a 1-story plant to cost $60,000 or more with equipment.

Kentucky

GHENT, KY. — City plans water supply system, including installation of 75,000-gallon steel tank on 100-foot tower, and pumping machinery. J. S. Watkins, consulting engineer, Citizens Bank building, Lexington, Ky.

LEXINGTON, KY. — Board of trustees, University of Kentucky, plans constructing new power plant at the institution. Cost is estimated at $250,000, with equipment. Financing is being arranged through federal aid. Frank L. McVey is president.

SCOTTSVILLE, KY. — City has PWA loan of $31,091 for constructing sewer system. R. O. Huntsman, mayor.

Maryland

BALTIMORE — American Oil Co., American building, has begun construction of a large oil terminal in the Port of Albany, N. Y. The terminal site covers 40 acres in East Greenbush, N. Y., south of Albany on Papscanee Island. In line with its general program of expansion, American Oil Co. is also building a $1,000,000 terminal on the Monongahela river in Pittsburgh.

District of Columbia

WASHINGTON — David Lynn, architect of the capitol, opens bids Sept. 10 for two 16-inch belt coal conveyors and a conveyor bridge and tower for capitol power plant.

WASHINGTON — Bureau of supplies and accounts, navy department, will receive bids Aug. 30, schedule 5765, one motor-driven drilling machine; schedule 5766, one motor-driven centerless lapping machine; schedule 5767, one motor-driven radial drill machine; schedule 5772, one hydraulic lift; schedule 5776, two motor-driven power squaring shears all delivered Philadelphia; Sept. 3, schedule 5754, one motor-driven geared head engine lathe; schedule 5757, two motor-driven geared head engine lathes.

Georgia

BRUNSWICK, GA. — Municipality has plans in progress for erection of electric power plant, cost of which will exceed $100,000. J. F. Ahern, Jacksonville, Fla., engineer.

COLUMBUS, GA. — J. P. Bradfield has contract for addition to Lummus Cotton Gin Co. machine shop.

GAINESVILLE, GA.—City voted $60,000 bonds for enlargement to waterworks system.

Louisiana

ALEXANDRIA, LA.—City, Mayor Lamkin, will issue $200,000 bonds for improvements and expansion to power plant.

Mississippi

CLEVELAND, MISS. — City plans extensions and improvements to electric light and power plant, including installation of new equipment. Fund of $350,000 is being secured through federal aid for this and waterworks project.

PONTOTOC, MISS. — Pontotoc Creameries, Frank Johnson manager, has started work of remodeling building formerly occupied by Pontotoc Canning Co., and plans to install equipment for manufacture of buttered and powdered milk.

Florida

AVON PARK, FLA. — City is having survey made for power system. Cost is estimated at $75,000. George A. Main, Daytona Beach, Fla., in charge of engineering.

MIAMI, FLA. — B. F. Goodrich Rubber Co., Akron, O., is reported establishing a factory branch here, costing $65,000 with equipment.

North Carolina

ANGIER, N. C. — Town has PWA allotment of $89,000 for waterworks system.

WINSTON-SALEM, N. C. — Crystal Ice & Coal Co. has taken over a 4-story building at Mitchell and Wachovia streets and will remodel and equip same for new ice manufacturing and cold storage plant. Cost close to $45,000, including equipment.

South Carolina

CHARLESTON, S. C. — Sullivan's Island board of town commissioners, Harry J. O'Neill chairman, plans to apply to J. L. M. Irby, acting state PWA director, Columbia, S. C., for $85,000 to install waterworks on Sullivan's Island.

Tennessee

CHATTANOOGA, TENN. — Doddridge-Booth & Co., Nashville, Tenn., is erecting a $50,000 plant here for manufacturing caskets.

West Virginia

HUNTINGTON, W. VA. — United States engineer will take bids Aug. 29, inv. 516-36-37, for storage tank, steel tower and pumping units.

Virginia

DANVILLE, VA. — City's application for grant of $1,237,909 for constructing a power system has been approved by President Roosevelt.

PETERSBURG, VA. — E. E. Titus Inc. has been incorporated with $25,000 capital, to operate a foundry and machine shop, by F. L. Wyche.

SOUTH NORFOLK, VA. — City, C. H. Hughes director of public works, plans erection of power plant; will install prime movers, boilers, diesel engine, generators, switch gear and distribution system.

Missouri

ROLLA, MO. — Curators of University of Missouri, care of C. H. Fulton, director of School of Mines & Metallurgy, plans erecting a geology and ceramics building, including power plant. PWA fund of $543,000 has been applied for.

Arkansas

AMITY, ARK. — City has PWA loan and grant of $34,000 for waterworks project.

Oklahoma

EL RENO, OKLA.—Canadian Mill & Elevator Co. plans to install power equipment in connection with the rebuilding of its grain mill and elevator. Herman K. Schafer is president.

OKLAHOMA CITY, OKLA. — Mid-Continent Pipe & Supply Co. Inc., has been chartered with $10,000 capital to operate a pipe yard and pipe threading shop. Joseph Brown is president

(*Please turn to Page* 82)

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(*Concluded from Page* 80)

and general manager. Headquarters have been established at 900 Southeast Twenty-ninth street.

OKMULGEE, OKLA. — Thompson Pump Co. has been organized with $20,000 capital to manufacture oil field pumps, by R. D. Thompson president, Seventeenth and Bryan streets.

TULSA, OKLA. — Central Foundry Co., 212 South Norfolk, manufacturer of iron castings, is erecting a new plant, 52 x 84 feet, at Lewis avenue and Frisco railroad. It will be equipped with a hand-operated craneway.

Texas

BOWIE, TEX. — City voted $60,000 bonds for erection of elecric light and power plant.

GREGGTON, TEX. — Standard Tool & Machine Co. has been incorporated with $15,000 capital, by W. Q. Pool manager.

HOUSTON, TEX. — United States Oil Tool Corp. has been organized by E. G. Lenzner, 409 Petroleum building, to manufacture oil field specialties. Erection of a manufacturing plant is planned.

LUBBOCK, TEX. — City has $112,500 PWA loan and grant for addition to power plant.

MATHIS, TEX. — Pettus Oil & Refining Co., Pettus, Tex., Morris Roberts in charge, plans installation of power equipment in new oil refining plant here, including pumping machinery, and steel tanks. Entire project will cost over $90,000.

PEARSALL, TEX. — Arrow Tool & Supply Co. has been organized to operate a machine shop and warehouse for oil field supplies, by J. E. Dobbins manager.

PORT LAVACA, TEX. — City F. M. Dudgeon, mayor, has PWA allotment for power plant, 120 x 180 feet. Two 125-horsepower gas engines, two 93.5 kilowatt generators and one 120-horsepower boiler will be installed.

TAYLOR, TEX. — Taylor Refining Co., care of G. I. Rowsey, plans to construct an oil refinery at Port Isabel, Tex., including terminal facilities Cost about $200,000.

Wisconsin

EDGAR, WIS. — Village is planning construction of $70,000 waterworks and sewage plant. Preliminary plans have been made by W. G. Kirchoffer, consulting engineer, 22 North Carroll street, Madison, Wis.

MADISON, WIS. — Wheeling Steel Corp., Wheeling, W. Va., is building a shop, 50 x 100 feet, for fabricating corrugated metal culverts here at South Brearly street.

MADISON, WIS. — Gisholt Machine Co. has started construction of an addition to its factory to be used for a boiler room, at a cost of about $25,000.

SHAWANO, WIS. — Municipal water and electric commission is having plans completed by Auler, Jensen & Brown, Oshkosh, Wis., for altering and constructing a 2-story, 52 x 110-foot addition to power house.

Minnesota

DRESBACH, MINN. — Maj. Dwight F. Johns, district government engineer, will take bids Sept. 5 for power, control and lighting system for lock and dam No. 7 in the Mississippi river, including incoming power line, lock lighting system transformers and regulators, gas-electric standby power unit and hand-operated traveling bridge crane.

ELY, MINN. — Emeralite Surfacing Products Co. has started construction of a coloring plant to replace old plant recently destroyed by fire.

PRESTON, MINN. — Village council will take bids Aug. 30 for construction of a municipal light and power plant addition and equipment, to cost about $50,000, including diesel engine, generating equipment, cooling tower, etc. G. M. Orr & Co., Baker building, Minneapolis, engineer.

Kansas

HUTCHINSON, KANS. — Central Core Drill Mfg. Co. has been organized by C. E. King president, to manufacture and distribute oil field drilling machinery.

LYONS, KANS. — Standish Pipe Line Co., subsidiary of Phillips Petroleum Co., Bartlesville, Okla., has completed plans for erection of a pumping station here.

North Dakota

JAMESTOWN, N. DAK. — Municipality plans electric light and power plant distribution system, costing about $650,000. Will apply for PWA funds.

WALHALLA, N. DAK. — Common council plans municipal electric light and power plant. Fund of about $50,000 will be arranged through PWA. C. L. Norton, Bismarck, N. Dak., consulting engineer.

South Dakota

BELLE FOURCHE, S. DAK.—Belle Fourche Bentonite Products Co., organized to mine clay deposits, has started construction of a new mill to handle 100 tons per day, grinding and cleaning the clay to reduce it to its commercial form.

Iowa

FAIRFIELD, IOWA — Louden Farm Machinery Co., manufacturer of equipment, plans rebuilding of factory damaged by tornado.

KEOKUK, IOWA — Iowa Fiber Box Co. plans construction of a 2-story factory to cost $40,000.

MUSCATINE, IOWA — City is considering special election to approve construction of city-owned hydroelectric generating plant on Cedar river, including transmission line, power substation, switching facilities, and electrical distribution lines. Estimated cost $3,500,000. Financing will be carried out through federal aid.

VILLISCA, IOWA — City council will take bids until Sept. 4 for construction of a municipal light and power plant, total cost to be $150,000, including power plant building, two diesel engine generating units, cooling system, fuel oil tanks and complete distribution system. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., engineer. (Noted July 29).

Nevada

HUMBOLDT, NEV. — Bureau of Reclamation, Denver, will receive bids until Aug. 28, specification 713-D, for five power-driven, double-drum, radial gate hoists, with one portable gasoline engine-driven unit, together with frames, hoists, semi-automatic gate hangers, etc., for spillway and outlet works at Rye Patch dam.

Pacific Coast

CAMARILLO, CALIF. — State has plans by G. M. McDougall, state architect, Public Works building, Sacramento, Calif., for erecting an industrial building, costing $75,000, and boiler and mechanical work, costing $55,000, at state hospital.

LOS ANGELES — Kieckhefer Container Co., Delair, N. J., is erecting a new factory building on Slauson avenue between Central avenue and Avalon boulevard here, at a cost of $50,000.

LOS ANGELES — Sterling Electric Motors Inc. is building a modern steel factory building as an addition to its plant at 5401 Telegraph road, Montebello, near here, at a cost of $40,000. New rapid-production machine tools and other equipment will be added.

MANHATTAN BEACH, CALIF. — Metlox Corp. is building a $35,000 addition to its plant here. The new building is an electric-welded steel structure that will house one of the most modern ceramic tunnel kilns.

SACRAMENTO, CALIF. — Golden State Soda Works, 1715 Fifteenth street, plans installation of electric power equipment in new 1-story bottling plant, 100 x 160 feet, costing close to $60,000. J. A. Saunders, company architect.

STOCKTON, CALIF. — State has plans by G. M. McDougall, state architect, Public Works building, Sacramento, Calif., for erection of state hospital units, including boiler house, costing $15,000, and sewage plant addition, costing $25,000.

TULARE, CALIF. — Tulare Milling Co. is building a cotton oil mill here and will install machinery at a cost of $20,000.

BREMERTON, WASH. — Puget Sound navy yard is having a site cleared for erection of a concrete and steel garage and fire station, costing about $104,000. Authority has been granted for a $100,000 industrial building at the naval ammunition depot to house copper, re-forming, machine, carpenter, electric and blacksmith shops, and a roundhouse.

SEATTLE — Garco Mfg. Co. has been incorporated by S. M. Lindquist and associates, to manufacture and sell gas engines, machinery and supplies. Papers were filed by Evans & McLaren, Dexter Horton building.

Dominion of Canada

STRATROY, ONT. — Canadian Turner Day Co. Ltd. is preparing plans for new boiler house and will purchase equipment.

STRATHROY, ONT.—Canadian Turner Day Co. Ltd. is preparing plans Parkside drive, Toronto, contemplates improvements to plant, including installation of new boiler house and special equipment. Estimated cost $30,000.

WINDSOR, ONT. — Chrysler Corp. of Canada Ltd. has announced plans for spending $350,000 for an addition to its plant here. Equipment will be installed to enable production of a greater number of parts under one roof.